

SECTION 4

Environmental Consequences

Section 4 describes the beneficial and adverse social, economic, and environmental effects of the alternatives and measures to mitigate adverse impacts. The information is intended to allow the reader to compare the environmental and socioeconomic effects of the alternatives. Three supplemental reports prepared for the project provide additional detail: Wetland Technical Report, Agricultural Impact Report, and Biological and Natural Resources Notebook.

Discussion of impacts in this section are generally presented in the following order:

- Overview of impacts from Jacksonville to Macomb via Alternative A, and Jacksonville to Macomb via Alternative E.
- Impacts to segments common to both alternatives, which includes two road segments: Jacksonville to Chapin along existing U.S. 67, and south of Beardstown (Drainage Road) north to Macomb.
- Impacts to Alternative A (excluding common segments), consisting of new alignment extending from Chapin north through Concord and Arenzville to south of Beardstown (Drainage Road).
- Impacts to Alternative E (excluding common segments), consisting of improvements to existing U.S. 67 from Chapin north to south of Beardstown (Drainage Road).

Figure 4-1 is a schematic showing common, Alternative A, and Alternative E alignments. Common segments are shown as green, Alternative A is shown as blue, and Alternative E is shown as orange. Impacts to resources resulting from proposed improvements are shown in detail as Figure 4-2. Figure 4-2 includes a sheet layout location map and 16 detailed maps showing impacts along common segments, eight detailed maps showing impacts along Alternative A, and nine detailed maps showing impacts along Alternative E. The detailed maps are color coded, numbered, and referred to in text as “Figure 4-2: Blue X,” directing the reader to a specific exhibit.

4.1 Social/ Economic Impacts

4.1.1 Summary of Impacts from Jacksonville to Macomb

Development of Alternative A from Jacksonville to Macomb (Common + Alternative A segments) would require 987 hectares (2,438 acres) of right-of-way (Table 4-1). Of that, 821 hectares (2,028 acres) would be new right-of-way, and 166 hectares (410 acres) would be existing right-of-way. In addition, existing U.S. 67 right-of-way between Jacksonville and Beardstown would also be maintained (approximately 138 hectares or 340 acres).

Alternative A would displace 75 structures, including residences, farmstead residences, outlot buildings, and business enterprises.

Development of Alternative E from Jacksonville to Macomb (Common + Alternative E segments) would require 1,067 hectares (2,636 acres) of right-of-way (Table 4-1). Of that, 780 hectares (1,927 acres) would be new right-of-way and 287 hectares (709 acres) would be existing right-of-way. Alternative E would displace 125 structures.

The No-Build Alternative would have no additional impacts to socioeconomic resources in the project area.

TABLE 4-1

Summary of Socioeconomic Impacts for Each Alternative (from Jacksonville to Macomb)

	No-Build Alternative	Alt. A from Jacksonville to Macomb (Common + Alt. A alignments)	Alt. E from Jacksonville to Macomb (Common + Alt. E alignments)
Total Right-of-Way Required	0	987 ha (2,438 ac)	1,067 ha (2,636 ac)
Amount of Existing Right-of-Way Used	0	166 ha (410 ac)	287 ha (709 ac)
Amount of New Right-of-Way Required	0	821 ha (2,028 ac)	780 ha (1,927 ac)
Residences	0	19	40
Outlot Buildings	0	54	83
Businesses	0	1	1
Public Facilities	0	1	1
Estimated Tax Loss	0	\$44,402	\$40,655

4.1.2 Community Changes

Carefully planned roadway improvements can foster beneficial results, such as making the community more cohesive and serving future growth and planning policies. Lack of careful planning, however, can have undesirable effects, and may even divide a community. The discussion below describes the potential effects of each alternative on community cohesion.

4.1.2.1 Common Segment

Communities within a common segment include Jacksonville, Rushville, Industry, and Macomb.

The alignment would connect with the recently completed Jacksonville Bypass. It would be compatible with existing uses along the Jacksonville Bypass and would not bisect or adversely affect uses in that area.

In Rushville, the alignment would bypass the community to the west and U.S. 67 would continue to be a local road through town. The bypass would not impose barriers among neighborhoods, separate residents from community facilities or services, or adversely affect vehicular or pedestrian patterns within the community. By removing through traffic from U.S. 67, the bypass would make U.S. 67 less of a barrier between east and west Rushville and would likely improve safety for pedestrian, bicycle, and local vehicular trips crossing U.S. 67 in route to Scripps Park. The bypass would not affect travel patterns between rural

areas and Rushville. No change in the level of community cohesion between the rural areas and Rushville is expected. The bypass would provide opportunities for undeveloped properties to fill the area between the proposed interchange and the intersection of U.S. 24 and U.S. 67, and would provide an opportunity to link the mature part of the city with the newly developing areas to the west.

The community of Industry would be bypassed to the west. The alignment would not separate residents from community facilities or services, impose barriers among existing neighborhoods, or adversely affect vehicular or pedestrian patterns within the community. The bypass would effectively remove through traffic along U.S. 67, making the town center safer for local vehicular and pedestrian traffic movement. Access would be provided to the community at both the north and south ends of the bypass, and travel connectivity between rural areas and Industry would be unchanged.

At U.S. 136 (project end) near Macomb, the corridor would be shifted very slightly to the east to tie in with the Macomb Bypass, which is under study by others. The alignment would be compatible with existing development along U.S. 136 and would not bisect or adversely affect uses in that area.

4.1.2.2 Alternative A

Communities along or near proposed Alternative A include Concord, Arenzville, and Beardstown.

Alternative A would be located along the east edge of the community of Concord, affecting the three residences closest to the railroad tracks. These residences would be relocated. Because the impact would occur at the community's east boundary rather than through its center, it would not affect community cohesion.

The alignment would bypass Arenzville about 2.4 kilometers (1.5 miles) west of the community. This location was selected following public input from residents throughout the area, who requested that the alignment be shifted west to minimize impact to their community and its rural setting. This alternative would significantly improve traffic and travel through Arenzville. Under current conditions, trucks going to Excel Corporation in Beardstown use Arenzville Road, traveling through the town of Arenzville. Large semi-trucks travel through the community in the early morning hours, driving past residences. Under Alternative A, this traffic would be redirected outside town to the expressway.

Alternative A would approach Beardstown in the southeast quadrant of the city and parallel its southern border before rejoining the common segment. It would provide improved access to the Beardstown's industrial area, located near the railroad tracks south of IL 125. Through this area, the alternative would not bisect any residential neighborhoods or separate community facilities from the population center. Generally, Alternative A would improve access to Beardstown and the community's industrial area without adverse impact to the community's existing or future land use plans.

This alternative would result in U.S. 67 being located farther from the community of Meredosia than the existing roadway is currently. Most of the businesses in Meredosia (which is on the Illinois River) are oriented toward the water-based transportation system—that is, they are there because they use the river to transport their products. Nonetheless, if

Alternative A was selected, Meredosia could be less favored by future development opportunities than other communities that would be closer to the proposed expressway.

4.1.2.3 Alternative E

Alternative E passes by or through Chapin, Bethel, Meredosia, and Beardstown.

In Chapin, Alternative E would be shifted to the north of the existing alignment. The shift was made in order to allow U.S. 67 to be used as a frontage road. The new alignment would displace three residences and nine out buildings. French Cemetery would be displaced; however, it has been determined that it does not contain any graves. A historic building that was located within the right-of-way that would be acquired, no longer exists. Two of the local neighborhood streets that currently have access to U.S. 67 would lose direct access, with access being maintained on a relocated Crews Lane. This would change travel patterns for residents but would make the streets safer, with less traffic noise.

Alternative E would remain on existing alignment through Bethel. The roadway generally defines the community with a few residential and commercial structures clustered along U.S. 67. The proposed improvements would widen the roadway, consolidate local access, and displace two homes. These minor changes would have minimal affect on a community that already has a highway as its primary feature.

Meredosia is 6.4 kilometers (4 miles) from U.S. 67, so the proposed roadway would have no direct effect on community cohesion and structure. Indirectly, however, the connection to Meredosia via IL 104 would be improved with an interchange. This faster and safer connection could benefit the businesses in Meredosia and enhance the potential for new economic growth.

Alternative E would bypass Beardstown to the west and skirt Beardstown Marsh and the developed areas along U.S. 67. The alignment would not divide any neighborhoods, separate residents from community facilities or services, or adversely affect vehicular or pedestrian patterns within the community. The bypass would not affect travel patterns between rural areas and Beardstown because access to U.S. 67 is provided both north and south of town. The bypass generally would provide the same level of access to the community provided by the existing alignment without serious disruption to existing or future land use patterns.

4.1.3 Environmental Justice

In accordance with the Federal Highway Administration (FHWA) Order 6640.23, this section addresses potential impacts and examines the spatial distribution among minority and low-income populations that could be affected by the proposed project alternatives.

There are three census tracts in the study area that contain minority populations. One census tract is located in Schuyler County just north of the river between Beardstown and Rushville, and two are located in the City of Beardstown. There are no residences along the corridor within the census tract in Schuyler County. Regarding the two census tracts in Beardstown, discussions with Beardstown City staff (Beach 2000) confirmed that there is an increasing minority (Hispanic) population moving to the community, however most of these residents live in Beardstown and therefore **will** not be affect by the proposed improvements. City staff further stated that, to their knowledge, the mobile homes located east of existing U.S. 67 and south of Honey Point Road (which would be impacted by Alternative E) do not house

minority or low-income residents. Therefore minority populations will not be adversely affected by the project.

The data output was also evaluated for the presence of low-income residents. The mean household size for the area was approximately three persons. The HHS defines the poverty threshold for a family of three as \$14,630. The output showed that none of the census tracts in the project area had median incomes below this poverty threshold.

In summary, the project would not have a disproportionately high or adverse impact on minority or low-income populations.

4.1.4 Community Services/ Facilities

4.1.4.1 Common Segment

There are several public services/utilities within the segment of the alignment common to both Alternatives A and E. Beardstown's Sanitary Sewage Treatment Plant borders U.S. 67 just south of the Illinois River. The proposed new bridge would be situated in nearly the same location as the old bridge, so no additional right-of-way would be required from the treatment plant site. Neither the sanitary treatment plant nor access to the plant would be altered in any way by the proposed U.S. 67 improvements.

North of the river, the Bainbridge Township Office and storage facility, which mainly serves as the township's materials storage yard, would be displaced as a result of the improvements. Nearly the entire site would be required for roadway improvements, so the facility would need to be relocated to another nearby property.

In Rushville, the Far West Bypass would avoid Scripps Park, the airport, and the site designated for the new state prison.

4.1.4.2 Alternative A

Alternative A would not adversely affect public services and utilities. Although there would be numerous relocations of underground and aboveground utilities, they would all be moved, as needed, before or during construction. The necessary precautions would be implemented during utility relocation to minimize any disturbances upon normal day-to-day household, institutional, and business operations.

Alternative A would have no direct impact on hospitals, nursing homes, churches, cemeteries, libraries, or fire stations in the study area. It would, however, indirectly affect Triopia School, located on Arenzville-Concord Road and Triopia Road. The proposed route would be 536 meters (1,760 feet) east of the school grounds, and would affect travel patterns to and past the school.

In the vicinity of Triopia School, the expressway would bridge over the railroad and the Triopia Road. This grade separation provides the highest degree of safety by separating crossing roadway traffic with the expressway and railroad. The through-traffic that travels past the Triopia School on Arenzville-Concord Road would shift to the expressway, reducing traffic on Arenzville-Concord Road. Overall, this would have a positive effect on travel safety for the local road network near the school. Triopia Road is a major access route to the school for students traveling from the east. The grade separation would eliminate

access to the expressway at this location, requiring a circuitous travel pattern to the nearest expressway access point.

Travel times would generally improve throughout the rural study area for emergency response times by police, fire, and ambulance service providers, since most existing roads would be served by at-grade intersections to the highway. In locations where access is controlled (at interchanges), adjacent property owners would be served by frontage roads or service drives, which could slightly increase response times for emergency vehicles. Alternative A would not be expected to affect school bus routes and travel times.

4.1.4.3 Alternative E

Alternative E would have minor impacts to one public facility along the route. Access to Western FS, Inc. (a regional farmer's co-op) at the corner of U.S. 67 and Bethel Lane in Bethel would be modified. This facility would no longer have direct access to U.S. 67. Access would instead be provided at the crossroad intersection (Bethel Lane), with an at-grade crossing with U.S. 67. The change in access would have minimal effect on the operation of the facility.

Other public services and utilities would not be adversely affected by this alternative. Although there would be numerous relocations of utilities above and below ground, they would all be moved, as needed, before or during construction. Precautions would be taken in relocating utilities to minimize any disruption of normal day-to-day household and business operations. There would be no direct impact to schools, hospitals, nursing homes, churches, libraries, fire stations, or cemeteries in the study area.

Travel times would generally improve throughout the rural study area for emergency response times by police, fire, and ambulance service providers since most existing roads would be served by at-grade intersections to the highway. In locations where access is controlled (at interchanges), adjacent property owners would be serviced with frontage roads or service drives, which could slightly increase response times for emergency vehicles. For the same reasons, school bus routes and service would not be expected to be diminished due to the proposed alternative.

4.1.5 Transportation

The No-Build Alternative would maintain existing traffic patterns and access. The design year traffic volumes on U.S. 67 are forecast to increase from between 2,050 to 8,300 vpd in 1995 to between **3,500 to 11,300** vpd in 2030.

The No-Build Alternative would neither change existing access patterns to the roadway nor eliminate through-town highway travel in Beardstown, Rushville, and Industry. Existing access patterns are unrestricted and provide for numerous turning movements on and off the highway. As traffic volumes increase, the potential conflicts between through traffic and turning traffic will also increase, and will ultimately increase the crash exposure and crash rates on the highway.

An important consideration in including the U.S. 67 corridor from the Quad Cities to Alton in the state's highway improvement program is to foster future economic development. Under the No-Build Alternative, the economic competitive position of the area could be adversely **affected**. The inefficiencies of a 2-lane highway could likely be a disincentive for

existing businesses to expand or new businesses to open. In the future, businesses may choose locations with better highway service to avoid congestion, delays, and lost profitability caused by inefficient traffic operations (see Section 4.1.8, *Economic Impacts*).

The build alternatives would provide high quality traffic service with free-flowing conditions. Generally, all side-road access would be provided with at-grade intersections. Fully controlled vehicle access would be the standard near Beardstown and Rushville. In these cases, interchanges would be provided for access to and from the highway. Fully controlled access near the interchanges would require some local access to be modified with frontage roads to the nearest crossroad. Interchanges are provided at locations that would have higher traffic volumes, therefore requiring greater safety considerations.

Alternatives A and E follow different alignments from Beardstown to Jacksonville; therefore, the effect on traffic volumes varies. Alternative A would carry **9,900 vpd** in 2030, whereas Alternative E would carry about **8,800 to 14,100 vpd**. Alternative A would provide a more direct route between population and employment centers.

The alignments for Alternatives A and E from Beardstown to Jacksonville affect travel access to communities differently. For example, Alternative A runs close to the Beardstown industrial area, Arenzville, and Concord; whereas Alternative E runs near Meredosia, Bethel, and Chapin.

The build alternatives would reduce congestion, particularly in the communities of Beardstown, Rushville, and Industry, and control access to the highway. Under the No-Build Alternative, the number of crashes on U.S. 67 would be expected to increase due to increased congestion and more frequent points of conflict at access locations. The build alternatives would accommodate increased travel in the corridor more safely.

The wide median in a 4-lane divided, access-controlled highway such as the build alternatives nearly eliminate head-on crashes, and the provisions for side road and driveway access reduce turning movement crashes.

4.1.6 Residential and Business Relocations

Table 4-2 summarizes the estimated number of displacements under Alternatives A and E.

TABLE 4-2
Residential and Business Displacements

	Common Alignment	Alternative A	Alternative E
Residences	13	6	27
Outlot Buildings (shed, barn, garage, silo, bin)	32	22	51
Business	1	0	0
Public Facilities	1	0	0

4.1.6.1 Common Segment

Within the common segment, 13 residences and farmsteads, 32 farm buildings, one business, and one public facility would be impacted. The business, Sullivan Brothers Fertilizer Company, is located at TR 247 and U.S. 67, and has one full-time employee at the facility. The public facility, Bainbridge Township Office, is located at Independence Hall Road and U.S. 67.

4.1.6.2 Alternative A

Alternative A would displace six residences and farmsteads and 22 farm buildings. In Concord, three residences would be displaced as a result of the improvement. This is the only location where a cluster of homes would be affected. Of the homes and farmsteads to be displaced, it is expected that most would be owner-occupied. According to the U.S. Bureau of the Census, 67 percent of all housing in the four-county area is owner-occupied. The percentage probably is actually higher in the study area, as the university populations in Macomb and Jacksonville contribute to the high percentage of renter-occupied housing. Based on field observation, it appears that each community in the study area consists of single-family residences. There are no known multi-family units along either alternative corridor.

The value of owner-occupied housing ranges from an average of \$33,000 in Cass County to an average of \$47,000 in Morgan County. According to local realtors, housing for displaced residents would be expected to be available, although the amount and quality of housing would vary with local market conditions. Housing availability will be reassessed during the project's design engineering and real estate acquisition phases. Many of the potential housing displacements are on farmsteads, with the occupant engaged in farming at that location. In these cases, it is expected that replacement housing could be provided elsewhere on the farm site.

Acquisition, relocation activities, and benefits will comply with provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Illinois Department of Transportation (IDOT) *Land Acquisition Procedures Manual*. Relocation resources are available to all who are relocated without discrimination.

4.1.6.3 Alternative E

Alternative E would displace 27 single-family residences and farmsteads and 51 farm storage structures (including sheds, barns, and silos). There are several mobile homes throughout the corridor. Alternative E would affect two clusters of mobile homes along the corridor. Two mobile homes on the east side of U.S. 67, just south of Honey Point Road would be displaced. Five mobile homes would be displaced on the east side of U.S. 67 south Beardstown (near of Edgewood Drive).

It is expected that most of the residences that would be displaced would be owner-occupied and that replacement housing would be readily available. Acquisition, relocation activities, and benefits will comply with provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the IDOT *Land Acquisition Procedures Manual*. Relocation resources are available without discrimination to all who are relocated.

4.1.7 Land Use Impacts

4.1.7.1 Right-of-Way Required

Along the common segment of the alignment, 667 hectares (1,648 acres) of right-of-way would be required for an upgraded roadway. Of that, 161 hectares (398 acres) of existing right-of-way would be used and 506 hectares (1,250 acres) of new right-of-way would be required (Table 4-3).

TABLE 4-3
Right-of-Way Requirements

	Common Alignment	Alternative A	Alternative E
Total Right-of-Way Required	667 ha (1,648 ac)	320 ha (790 ac)	400 ha (988 ac)
Amount of Existing Right-of-Way Used	161 ha (398 ac)	5 ha (12 ac)	126 ha (311 ac)
Amount of New Right-of-Way Required	506 ha (1,250 ac)	315 ha (778 ac)	274 ha (677 ac)

Alternative A would require 320 hectares (790 acres) of right-of-way; 5 hectares (12 acres) would be existing right-of-way and 315 hectares (778 acres) would be newly acquired right-of-way. In addition to maintaining the newly constructed Alternative A right-of-way, the existing U.S. 67 right-of-way between Jacksonville and Beardstown would also be maintained (this totals approximately 138 hectares or 340 acres).

Construction of Alternative E would use 400 hectares (988 acres) of right-of-way. Of this total, about 32 percent or 126 hectares (311 acres) would be existing right-of-way, and 274 hectares (677 acres) of new right-of-way.

4.1.7.2 Land Use Changes

The dominant land use impact throughout the project would involve conversion of agricultural lands to roadway use (Table 4-4).

TABLE 4-4
Land Use Impacts

	Common Alignment	Alternative A	Alternative E
Amount of New Right-of-Way Required	506 ha (1,250 ac)	315 ha (778 ac)	274 ha (677 ac)
Agriculture/Pasture	376 ha (929 ac)	286 ha (706 ac)	211 ha (521 ac)
Woodlands (mesic forest, floodplain forest, and pine plantation)	82 ha (203 ac)	14 ha (34 ac)	28 ha (69 ac)
Developed Lands	17 ha (41 ac)	3 ha (8 ac)	19 ha (47 ac)
Ecological Areas	31 ha (77 ac)	12 ha (30 ac)	16 (40 ac)

Throughout the corridor, an upgraded roadway facility would improve access and mobility to the area, which could induce the further conversion of agricultural lands for other purposes. The potential for secondary development may be greatest for the larger communities in the corridor, such as Jacksonville and Macomb. Development is already occurring near the Jacksonville Bypass. Generally, development is located near I-72, but it could be expected to expand to the north along the bypass.

Some potential for secondary development would also exist for the communities of Beardstown, Rushville, and Industry. Beardstown has put economic incentive tools in place to attract new industry to their community. The city has met with developers interested in establishing a riverboat casino on the Illinois River just west of the U.S. 67 bridge. Beardstown maintains that improvements to U.S. 67 will allow it to compete more favorably for development that would increase its economic base. Similarly, Rushville has been taking steps to expand its economic base. Notably, Rushville has recently been identified as the location for a new medium security state prison. The prison will be sited near the Rushville airfield just west of U.S. 67. Rushville is also a strong advocate for improving U.S. 67, which it believes would have a positive influence on attracting new commerce to their community.

4.1.7.3 Consistency of the Proposed Action with Land Use Plans

As detailed in Section 2.1.6, *Land Use*, Macomb is the only community in the project area that has an adopted land use plan (dated 1989). Most of the communities, however, are able to articulate general directions of growth, as well as preferred locations for specialized uses.

Generally, both along the common segment as well as along either alternative, improvements to the corridor would most likely result in the conversion of some lands near the bypasses from agricultural to nonagricultural use. Land use management at the local level can provide for orderly development at acceptable locations, while minimizing the potential for the indiscriminate conversion of agricultural lands. Therefore, local municipalities must establish guidelines early that regulate the expansion of development where undesirable.

Common Segment. The proposed upgrade of U.S. 67 would be consistent with other recent roadway improvements in the vicinity of Jacksonville, including the Jacksonville Bypass. It would also be consistent with the growth and development patterns of the community.

In Rushville, a bypass would be in keeping with the community's intended development pattern. Most new development has been occurring west of town; furthermore, Rushville has earmarked county-owned lands west of town for industrial or large institutional uses and will be the location for a new state prison. The bypass would be compatible with growth and intended development of the community.

A bypass would be provided around Industry. Convenient access to the community would be maintained, but existing through-traffic would be removed from the town center and disruption to existing development would be avoided. The bypass is not inconsistent with any known plans for future growth.

The connection of U.S. 67 with U.S. 136 (and, eventually, with the Macomb Bypass) would be consistent with Macomb's long-term growth and development plans. The location of U.S. 67 has been coordinated with other roadway improvement plans for Macomb in order to ensure that the proposed improvements benefit the community.

Alternative A. The proposed alignment for Alternative A would encroach upon the eastern edge of Concord, displacing three residences. Generally, a 4-lane high-speed expressway would be inconsistent with the village qualities of Concord.

Alternative A would bypass Arenzville. Convenient access to the community would be maintained, existing through-traffic would be removed from the town center, and disruption to existing development would be avoided. The bypass would be consistent with the village's desires, as expressed through the roadway development process (see Section 5, *Agency Coordination and Public Involvement*).

Alternative A would be routed along the south edge of Beardstown. Beardstown has established an enterprise zone to encourage development near its industrial area adjacent to the Beardstown Airport and the Burlington Northern-Santa Fe (BNSF) rail tracks. Alternative A would be favorable to the location of existing and future industrial development in this location on the east side of Beardstown. Alternative A would not encroach upon or disrupt established neighborhoods or commercial business areas.

Alternative E. Existing U.S. 67 is currently routed through Bethel and Chapin. The proposed alignment for Alternative E would remain on existing alignment without any notable changes to the character of Bethel. Alternative E would be shifted about **50 meters (160 feet)** to the north of the existing U.S. 67 in Chapin. Existing U.S. 67 would remain as a frontage road providing access to businesses and community residential areas.

Alternative E would approach Beardstown from the south, and skirt the west side of the community. Beardstown has established an enterprise zone to encourage development near its industrial area adjacent to the Beardstown Airport and the BNSF rail tracks. Alternative E would not be incompatible with land use development in Beardstown, although this alignment would not provide direct access adjacent to that area. Alternative E would not encroach upon or disrupt established neighborhoods or commercial business areas.

4.1.8 Economic Impacts

4.1.8.1 Employment

The following analysis measures the change in employment and wage value associated with the build and No-Build Alternatives through 2020. Employment and population data used in the analysis is reported in the Regional Economic Information System (REIS) maintained by the U.S. Bureau of Economic Analysis. The REIS provided data for existing population and employment through 1995. Future population and employment forecasts through 2020 are based on historical trends and multi-variable regression analysis.

In general, the historical data shows that the four-county area experienced a 0.5-percent annual decline in population over the past 18 years. During the same period, employment grew at a rate exceeding 1.4 percent annually. McDonough County has a strong government employment sector, which reflects the location of Western Illinois University. McDonough County also exhibits a strong retail trade employment sector, responding to the demands of the university population as well as serving as a retail trade center for the region. At the southern end of the corridor, Morgan County demonstrates a strong and growing service employment sector as well as a growing manufacturing component. Retail trade is also

strong and growing. Both Cass and Schuyler counties exhibit relatively small economies in comparison.

Under the No-Build Alternative, the rate of population and employment growth in the four-county area would be expected to grow at a rate comparable to the past. The average annual employment growth rate through 2010 is estimated to be 1.21 percent, slightly less than the annual average growth rate of 1.43 percent between 1980 and 1997. The basis for the lower employment growth rate assumes that without continued investment in transportation, the growth rate will level off and decline in the future. Population is estimated to decline over the next 20 years under the No-Build Alternative to about 83,000 by 2010 and about 78,000 by 2020 (Table 4-5). During the same period, employment would grow to about 50,000 by 2010 and 56,000 by 2020. The corresponding wage values of employment 2010 and 2020 are \$1.25 billion and \$1.55 billion respectively.

TABLE 4-5
Employment and Demographic Analysis Differences

Year	Build Alternative			No-Build Alternative		
	Population	Wage/Salary Employment	Wages & Salaries (\$000)	Population	Wage/Salary Employment	Wages & Salaries (\$000)
1980	98,702	34,953	\$391,749	98,702	34,953	\$391,749
1990	92,571	37,889	\$643,839	92,571	37,889	\$643,839
2000	90,323	47,331	\$1,034,925	87,818	44,206	\$956,097
2010	88,285	56,908	\$1,427,108	82,840	50,114	\$1,255,769
2020	86,247	66,484	\$1,819,292	77,862	56,023	\$1,555,441

Source: The SGM Group, Inc.

The build alternatives would support local and regional economic goals and objectives by providing reliable travel to and through the area and convenient access for farm-to-market transportation and industrial areas. Over the long term, the build alternatives would assist all sectors of the economy to generate additional development and jobs, thereby enhancing the project area and regional economy.

Under either of the build alternatives, jobs in the area are expected to increase over the next 20 years, whereas population is expected to be stable or decline slightly. Normal circumstances would suggest that more jobs would cause population to increase. Rural areas in some cases, however, tend to respond differently to a build up of jobs. In the project area, the demand for more workers is expected to respond with an increase in two-income families and workers traveling from longer distances. In the latter situation, workers would generally travel from surrounding counties to the new job opportunities rather than move their residence. This is common in rural areas where the choice of residence tends to be more important than the distance to the job location. Subsequently, the increase in jobs associated with the build alternative is not expected to increase the requirement for residential development in the project area. Overall, these conditions suggest that the existing housing stock would be sufficient for future population levels. Any growth in housing would be minimal, and largely related to personal preferences that would cause

individuals to move from existing housing to new housing. Similar to industrial development, new housing would be expected to locate in or near established communities.

The No-Build Alternative would lead to a lower rate of job growth than the build alternative. By the year 2020, jobs in the project area would total about 20,000 more than current levels, or 10,500 less than for the build alternative. Population, on the other hand, would be substantially less than the current levels. Overall, the No-Build Alternative would cause economic growth in those communities that have available land and supporting infrastructure, similar to the build alternatives. The No-Build Alternative would have no requirements for additional housing or community business.

The long-term average annual rate of employment growth with the build alternatives is estimated to be 1.75 percent. This rate is nearly 25 percent greater than that experienced from 1980 through 1998 (1.43 percent). The average projected difference in the respective employment growth rates for the Build and No-Build Alternatives is approximately 0.5 percent compounded annually. Over time, this small difference generates a significant difference in total regional employment, equating to about 10,500 jobs by 2020 (Table 4-5). The total number of jobs in the four-county area in 2020 would have a wage value of \$1.82 billion, or about \$270 million more than the No-Build Alternative. Using an average annual discount rate of 6 percent, the yearly differences translate into a net present value of nearly \$1 billion from 1998 to 2010, and just over \$1.7 billion from 1998 to 2020. This analysis demonstrates that a small change in the capture rate of new economic development resulting from transportation improvements would generate a significant economic value for the project area and the region.

It is expected that the one business that would be impacted would be able to relocate elsewhere on the property; therefore, no employment losses are expected. Further, no farm employment losses are expected along the corridor, as most of the property takes would be small strips of land and not full farm takes.

4.1.8.2 Property Values

When existing roads are expanded or new roads are constructed, the market value of adjacent properties may be affected. Generally, fronting residential properties suffer decline in value due to an increase in traffic, noise, and air pollution. Businesses may increase in value due to the improved access for customers and delivery vehicles. It is difficult to speculate on these impacts, since properties must be sold to determine market value and then a comparison made to recent sales prices for similar properties.

An improved expressway facility can be expected to have a positive effect on property values over the long term with improved access stimulating business development. While property values of individual parcels may decline, the cumulative impact of property value changes is anticipated to be positive for the communities and for the region.

4.1.8.3 Tax Revenues

A short-term tax revenue loss in the region will result from converting taxable land into a non-taxable transportation use. To evaluate the tax losses, information was obtained from the County Tax Assessors' offices for Morgan, Cass, Schuyler, and McDonough counties. All taxing districts, including schools, fire protection, sanitary districts, drainage districts, and

individual communities, were delineated. The taxable properties to be acquired for right-of-way were estimated in hectares and separated into commercial/residential and farms, when possible, due to different tax rates. The results of this analysis are summarized in Table 4-6, with detail of impact to each taxing body, by alternative, provided Appendix A.

TABLE 4-6
Estimated Tax Loss Summary, by Alternative

Alternative	Total Taxes in 1998 (\$)	Estimated Tax Loss (\$)	Percent of Total Taxes
Common Alignment	38,903,331	28,129	.0007
Morgan County	16,116,847	5,223	.0003
Cass County	4,550,222	2,177	.0005
Schuyler County	4,286,199	11,290	.0026
McDonough County	13,950,063	9,439	.0007
Alternative A	10,638,029	16,273	0.0015
Morgan County	6,043,066	10,412	.0017
Cass County	4,594,963	5,861	0.0013
Alternative E	11,343,586	12,526	0.0011
Morgan County	7,058,837	9,285	0.0013
Cass County	4,284,749	3,241	0.0008

The tax loss analysis shows that total annual property tax losses are estimated to be \$28,129 along the common alignment. This potential loss represents less than 0.0007 percent of the total annual taxes collected by the taxing entities. For Alternative A, the total annual property tax losses are estimated to be \$16,273, or 0.0015 percent of the total annual taxes collected. For Alternative E, the total annual property tax losses are estimated to be \$12,526, or 0.0011 percent of the total annual taxes collected.

4.1.9 Bypass Issues

Both Alternatives A and E, as well as the common segment of the alignment, would involve bypasses around many of the communities in the study area (i.e., Chapin, Beardstown, Arenzville, Rushville, and Industry). Roadway access around the bypasses would be fully access controlled (see Section 3, *Alternatives*). Access to properties along community bypasses would be provided by access roads or by relocating driveways to nearby public roads. At most community bypasses, access to the communities would be provided by interchanges or at-grade intersection at each end of the community.

Bypasses can cause a variety of changes to the community character, either beneficial or adverse. For example, residential areas near the existing corridor could experience the benefit of less traffic and traffic-related noise. However, highway dependent businesses may experience a loss in business revenue.

Several research efforts have focused on addressing the direct and indirect effects of bypass alternatives on communities. A study in Wisconsin (Wisconsin Department of Transportation 1988) surveyed six Wisconsin communities where highway bypasses have been in place for several years to determine the perceived impacts on the local economic base, traffic conditions, and community planning. The findings of this study are summarized below.

- **Number of Jobs**—There was a wide diversity of opinion on the influence of a bypass on the employment base. Some communities credited the bypass for bringing jobs, but others did not express the same viewpoint.
- **Traffic Congestion on Old Highway**—A strong majority from each community felt that the bypass reduced traffic congestion on the old route through town.
- **Pedestrian Safety on Old Highway**—In every community, a majority felt that the bypass contributed to increased pedestrian safety.
- **Truck Traffic on Old Highway**—A strong majority in every community felt the bypass had noticeably reduced the number of large trucks passing through the community.
- **Types of Business Located on the Old Highway**—Opinions varied regarding the influence of a bypass on the mix of businesses along the old route through town. In general, there was not a strong consensus whether the bypasses caused transition to fewer traffic-sensitive businesses on the old routes.
- **Profitability of Businesses on Old Highway**—There was a diversity of opinion regarding the influence of a bypass on business revenues. Some felt that the bypass had little or no influence on business revenue, while others were unsure of the effects.
- **Quality of Life for People Living Along Old Highway**—In most communities, some respondents felt that the bypass resulted in improvements to neighborhoods and the quality of life along the existing highway.

4.1.9.1 Common Segment

In Beardstown, the intersection of U.S. 67 and IL 125 contains several highway-oriented businesses such as fast-food establishments, local restaurants, a Wal-Mart, motel, and a gas station. This intersection is an important commercial node to the community and caters to local patrons, highway users, and residents living in and outside of Beardstown. The bypass would be expected to cause a minor loss of through traffic but would not have any measurable effect on business operations at that location. This commercial node would be near the highway interchange and would be clearly visible from the bypass. Highway visibility and convenient on/off access are two critical factors for maintaining highway-oriented business. Additionally, many of the businesses serve local and regional residents, which will sustain the long-term vitality of the businesses. Overall, the character of the area would not be expected to change because of the bypass.

In Rushville, the intersection of U.S. 67 and U.S. 24 contains some traffic-dependent businesses, such as Hardee's and a gas station. However, it is likely that most of the patrons of these businesses are local. The bypass would result in a loss of U.S. 67 through traffic, but would not be expected to jeopardize the businesses in this area.

Industry has few or no businesses that are highway-oriented or traffic-dependent, and it is unlikely that the bypass would lead to negative business effects for the community. The reduction of through-town traffic in Industry would improve safety, reduce noise, and more easily accommodate local travel.

4.1.9.2 Alternative A

Meredosia's major businesses are dependent upon water and highway transportation. Currently, the highway network serving Meredosia has sufficiently matured to provide for the adequate movement of freight to and from the community. Meredosia is situated on IL 104 to the west of existing U.S. 67; therefore, travel to and through the community of Meredosia is purposeful either with Meredosia as a destination or points beyond. Although the highway-dependent businesses such as restaurants, gas stations, and convenience stores are located in Meredosia, these businesses are dependent largely on local residents and through traffic on IL 104. Alternative A would be situated several kilometers (miles) east of existing U.S. 67; however, the existing highway network would remain and continue to provide the same access to Meredosia. Overall, Alternative A would provide improved regional travel **throughout** the area that would provide long-term benefit to Meredosia and other communities in the area. Therefore, Alternative A would not be expected to have any long-term negative impacts to Meredosia's industrial or service-oriented businesses.

The community of Arenzville has few or no businesses that are highway-oriented or traffic-dependent, and it is unlikely that the bypass would lead to negative business affects for the community. Arenzville is not located along existing U.S. 67 or any major highway, and would not be very near to either of the proposed alternatives.

Similarly, Concord is not situated along any major highway facility and has not developed through-traffic dependent businesses. However, this community would likely experience long-term negative impacts if Alternative A is chosen, as this alternative would not bypass, but go through this small community. In addition to causing residential displacements, the community would experience increased traffic noise levels.

4.1.9.3 Alternative E

There is one traffic-dependent business in Chapin. Some highway-oriented businesses that experience negative impacts due to bypasses have been able to overcome losses in revenue through various methods such as altering business practices toward serving local demand (most often used method), advertising to drivers on the new bypass, and relocating the business nearer to the bypass (least used method) (IDOT [Envirodyne] 1985).

4.2 Agricultural Impacts

Agriculture is the predominant land use in the project area. Agricultural land would be directly affected by each build alternative. The development of the build alternatives considered the impacts to farmland by locating the alternative alignments to minimize displacement and avoid farm severance that would be difficult to farm (refer to the Agriculture Technical Report for details). Agricultural impacts include farmland displacement, cropland and pastureland severances, altered field access, farm building relocations, and farm residence and out building displacements. The potential effects of property severances include changes in cropping patterns, irrigation practices, and field access.

4.2.1 Summary of Impacts from Jacksonville to Macomb

Development of Alternative A from Jacksonville to Macomb (Common + Alternative A segments) would require 758 hectares (1,873 acres) of agricultural lands (Table 4-7). Of that, 67 percent of those lands are considered prime farmland and 23 percent are important farmland.

Development of Alternative E from Jacksonville to Macomb (Common + Alternative E segments) would require 697 hectares (1,722 acres) of agricultural lands. Of that, 68 percent of those lands are considered prime farmland and 25 percent are important farmland.

Under the No-Build Alternative, none of the physical impacts would occur (i.e., loss of farmland, field severances, farm building displacements). However, lack of an improved roadway would have agricultural impacts such as slower shipping of agricultural commodities to market; and new industries that use agricultural products may not find relocation to this area as attractive as an area with better farm-to-market access.

The following sections contrast the agricultural impacts resulting from the various build alternatives.

TABLE 4-7

Summary of Agricultural Impacts for Each Alternative (from Jacksonville to Macomb)

	No-Build Alternative	Alt. A from Jacksonville to Macomb (Common + Alt. A alignments)	Alt. E from Jacksonville to Macomb (Common + Alt. E alignments)
Total New Right-of-Way that is Agricultural Land	0	758 ha (1,873 ac)	697 ha (1,722 ac)
Prime farmland	0	508 ha (1,255 ac)	475 ha (1,174 ac)
Important farmland	0	177 ha (437 ac)	171 ha (423 ac)
Total Number of Affected Farms	0	153	169
Centennial farms	0	1	4
Landlocked Parcels	0	6	11

4.2.2 Agricultural Acres Required

Right-of-way impacts were calculated for each proposed alternative by converting cover type information collected by the Illinois Natural History Survey (INHS) and inputting that into Auto-CAD. From there, it was imported into a geographical information system (GIS) for quantification purposes. Soils information (capability classes, prime farmlands, etc.) was obtained from soil maps at a scale of 1:15,840. The accuracy of these measurements is influenced by the distortion of the aerial photographs. All right-of-way requirements are based on preliminary engineering design and are subject to refinement and modification in final design. Although these refinements may affect the degree of impact to individual farm units, the relative impacts to agricultural resources within the study corridor from a selected alternative will not be significantly affected.

The amount of agricultural land required for the U.S. 67 right-of-way was summarized into two categories: agriculture/pasture use and woodland use. Agriculture/pasture use includes cropland as well as pasture land. Woodland category includes pine plantations as well as forested areas within farm plots.

4.2.2.1 Common Segment

The common segment would require 458 hectares (1,132 acres) of agricultural use land (Table 4-8). Of this total, 82 percent or 376 hectares (929 acres) are agriculture/pasture lands and 18 percent or 82 hectares (203 acres) are woodlands.

4.2.2.2 Alternative A

Alternative A would require 300 hectares (741 acres) of agricultural use land. Of this total, 95 percent or 286 hectares (706 acres) are agriculture/pasture lands and 14 hectares (34 acres) are woodlands.

4.2.2.3 Alternative E

Alternative E would require 239 hectares (590 acres) of agricultural use land. This total includes 211 hectares (521 acres) of agriculture/pasturelands (88 percent) and 28 hectares (69 acres) of woodlands (12 percent).

4.2.3 Prime and Important Farmlands Required

The U.S. Department of Agriculture (USDA) divides farmland into several categories to describe aspects of its resource value: prime farmland, unique farmland other than prime, farmland of statewide importance, and farmland of local importance. Since unique farmland and additional farmland of local importance are reportedly not present in the affected counties, they are not discussed.

As defined by USDA, prime farmland is land that offers the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It may exist as cropland, pastureland, rangeland, forestland, or other land, but it is not designated in urbanized areas or in bodies of water. Prime farmland produces the highest yields when treated and managed according to acceptable farming methods. Important farmland is land valued for agricultural production but lacks the best combination of physical and chemical characteristics of prime farmland.

4.2.3.1 Common Segment

The common segment would require 334 hectares (825 acres) of prime farmland and 78 hectares (193 acres) of important farmland (Table 4-8). Prime and important soil types represent about 89 percent of the total farm acreage affected.

TABLE 4-8
Agricultural Impacts

	Common Segment	Alternative A	Alternative E
Amount of Existing Right-of-Way Used	161 ha (398 ac)	5 ha (12 ac)	126 ha (311 ac)
Amount of New Right-of-Way Required	506 ha (1,250 ac)	315 ha (778 ac)	274 ha (677 ac)

TABLE 4-8
Agricultural Impacts

	Common Segment	Alternative A	Alternative E
Total Right-of-Way Required	667 ha (1,648 ac)	320 ha (790 ac)	400 ha (988 ac)
Pastureland	376 ha (929 ac)	286 ha (706 ac)	211 ha (521 ac)
Woodland	82 ha (203 ac)	14 ha (34 ac)	28 ha (69 ac)
Total New Right-of-Way that is Agricultural Land	458 ha (1,132 ac)	300 ha (741 ac)	239 ha (590 ac)
Prime farmland	334 ha (825 ac)	174 ha (430 ac)	141 ha (349 ac)
Important farmland	78 ha (193 ac)	99 ha (244c)	93 ha (230 ac)
Other (unclassified)	46 ha (114 ac)	27 ha (67 ac)	5 ha (11 ac)
Total	458 ha (1,132 ac)	300 ha (741 ac)	239 ha (590 ac)
Severed Farms	21	27	4
Otherwise Affected Farms	89	16	55
Total Number of Affected Farms	110	43	59
Centennial farms	0	1	4
Houses Taken	0	0	0
Affected Land Parcels	0	1	4
Landlocked Parcels	6	0	5
Farmsteads*	6	3	12
Other Structures	32	22	51
Adverse Travel	0.5 km (0.3 mi)	2.2 km (1.4 mi)	2 km (1.2 mi)
Agricultural Protection Area	0	0	0
Conservation Reserve Program	0	2.5 ha (8.7 ac)	1 ha (2.5 ac)
Estimated Farm Production Losses (\$)	\$305,100	\$255,200	\$187,500

* Number of farmstead impacts is a subset of total residential displacements that would occur. Farmsteads consist of residences located on a large plot of land that is in agricultural production.

4.2.3.2 Alternative A

Alternative A would require 174 hectares (430 acres) of prime farmland and 99 hectares (244 acres) of important farmland. Prime and important soils represent about 91 percent of the total farm acreage affected.

4.2.3.3 Alternative E

Alternative E would require 141 hectares (349 acres) of prime farmland and 93 hectares (230 acres) of important farmland, or about 98 percent of the total farm acreage affected for the proposed alternative.

4.2.4 Soil Capability Grouping

Eight soil capability classes are used to describe the general suitability of most kinds of field crops.

- **Class I** soils have few limitations that restrict their use.
- **Class II** soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.
- **Class III** soils have very severe limitations that reduce the choice of plants, require very special conservation, or both.
- **Class IV** soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
- **Class V** soils are subject to little or no erosion but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife habitat.
- **Class VI** soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, range, woodland, or wildlife habitat.
- **Class VII** soils have very severe limitations that make them unsuited to cultivation and restrict their use largely to pasture, range, woodland, or wildlife habitat.
- **Class VIII** soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife habitat, water supply, or aesthetic purposes.

There are over 120 soil types along the proposed alignment alternatives. By overlaying the proposed right-of-way limits on the soil survey maps, soils were identified for each alternative. Existing right-of-way was excluded from the overall effects, because existing right-of-way already has been converted permanently to nonagricultural uses. Generally, Classes I and II are considered prime soils. Table 4-9 summarizes affected lands by soil class for the common segment and Alternatives A and E.

TABLE 4-9
Quantification of Effects by Soil Capability

Soil Grouping	Common Segment	Alternative A	Alternative E
Class I	126 ha (312ac)	70 ha (174 ac)	76 ha (188 ac)
Class II	232 ha (573 ac)	105 ha (259 ac)	76 ha (188 ac)
Class III	64 ha (158 ac)	55 ha (136 ac)	27 ha (66 ac)
Class IV	24 ha (59 ac)	30 ha (74 ac)	7 ha (17 ac)
Class V	2 ha (5 ac)	0	0
Class VI	47 ha (116 ac)	42 ha (103 ac)	86 ha (213 ac)
Class VII	11 ha (27 ac)	13 ha (32 ac)	2 ha (5 ac)
Total	506 ha (1,250 ac)	315 ha (778 ac)	274 ha (677 ac)

4.2.4.1 Common Segment

The common segment will require 126 hectares (312 acres) of Class I soils and 232 hectares (573 acres) of Class II soils.

4.2.4.2 Alternative A

Alternative A will require 70 hectares (174 acres) of Class I soils and 105 hectares (259 acres) of Class II soils.

4.2.4.3 Alternative E

Alternative E will require 76 hectares (188 acres) of Class I soils and 76 hectares (188 acres) of Class II soils.

4.2.5 Land Evaluation and Site Assessment System

The Illinois Department of Agriculture (IDOA) uses the Land Evaluation and Site Assessment (LESA) system to assess overall impacts to agriculture caused by state and federal projects. The LESA system consists of two parts: land evaluation and site assessment. The LESA system is used to rate the agricultural productivity of farmland as indicated by soils information. The NRCS determines and provides this information on U.S. Department of Agriculture Form AD-1006, which is derived by implementing regulations from the Federal Farmland Protection Policy Act (49 FR 17716 ff). The site assessment system considers all other factors **relevant** to agricultural concerns such as compatibility with agricultural operations, benefits to agriculture, and compatibility with local comprehensive land use plans. LESA results are based on the total alternative right-of-way acreage.

The maximum score that can be received under the LESA evaluation is 300 points. The **higher** the point value assigned to a corridor, the more viable it is for agricultural uses. The Common Segment scored 212 points; Alternative A scored 213 points; and Alternative E scored 187 points. The complete LESA evaluation form is included in Appendix K.

4.2.6 Conservation Reserve Program

4.2.6.1 Common Segment

There are no known areas within the Conservation Reserve Program (CRP) program that would be affected along the common segment.¹

4.2.6.2 Alternative A

Along the proposed Alternative A alignment, one area in the CRP program would be affected, requiring a total of 2.5 hectares (8.7 acres) of CRP lands for roadway improvements.

4.2.6.3 Alternative E

Along the proposed Alternative E alignment, two areas in the CRP program would be affected by the improvements. One hectare (2.5 acres) of CRP lands would be required for the roadway improvements along Alternative E.

¹ The Conservation Reserve Program was established to prevent or control loss of important agricultural soils through erosion, principally by eliminating cultivation. If designated under the CRP guidelines, the farmer signs a 10-year contract with the USDA in which he agrees to take eligible land out of annual crop production.

4.2.7 Designated Agricultural Protection Areas

No known designated agricultural protection areas would be affected by either of the alternatives.²

4.2.8 Centennial Farms

4.2.8.1 Common Segment

No centennial farms would be affected along the common segment portion of the roadway.³

4.2.8.2 Alternative A

Alternative A would affect the centennial farm registered to William and Helen Hinkleman. About 19.3 hectares (47.7 acres) of productive farmland would be required for the proposed roadway improvements. The two homes on the property would not be affected.

4.2.8.3 Alternative E

Alternative E would require right-of-way from four centennial farms, all in Morgan County. All the affected centennial farms are located along U.S. 67. None of the centennial farm houses would be affected. Specific properties that would be impacted include:

- One centennial farm property registered to Arthur French and Ruth Wilson is located about 0.2 kilometer (0.1 mile) north of U.S. 67. Alternative E would affect about 3.6 hectares (8.8 acres) of land that is not currently cultivated. Three farm buildings and one dwelling (not the primary residence) would be displaced.
- The second centennial farm is registered to Myron French Anderson. **Approximately 3.5 hectares (8.7 acres)** of right-of-way would be required from the frontage of this property. The residence, located north of U.S. 67, would not be affected.
- The third centennial farm is registered to Eloise Ruh and Mildred Leonhard. The proposed roadway improvements would require 3.3 hectares (8.2 acres) of productive farmland. Neither the farm residence or farm buildings would be disturbed.
- The fourth centennial farm is registered to Lorange and Dena Fricke. About 3 hectares (7.4 acres) of their farmland would be required for roadway purposes. The residence would not be affected.

4.2.9 Severed and Otherwise Affected Farm Operations

A “severed” farm is an area severed either diagonally or laterally by the proposed right-of-way, thus dividing a single area of land into two or more plots. An “otherwise affected” farm operation is one that is affected by the right-of-way, but not divided into separate farm areas. Additional detail for each alternative, by county, can be found in the Agricultural Technical Report prepared for this project.

² The Agricultural Areas Conservation and Protection Act allows for areas of land greater than 500 acres (about 200 hectares) to be designated as agricultural protection areas. These areas were established to conserve, protect, and encourage the development and improvement of agricultural lands for the production of food and other agricultural products.

³ Centennial farms are farms that have been owned by the same family for over 100 years.

4.2.9.1 Common Segment

The common segment of the alignment would, for the most part, involve reconstruction of existing U.S. 67. Farming along existing U.S. 67 has adapted to the roadway, which has been present for many decades. Therefore, most farmland acquisition would be strip takings along field edges rather than severances. Right-of-way would be required from 110 farms along this part of the roadway. Of those, 89 would be “otherwise affected.” Another 21 farm operations would be severed (17 would be diagonally severed and four would be laterally severed). Generally, the farm severances occur along the community bypasses in Rushville and Industry.

4.2.9.2 Alternative A

As Alternative A is on new alignment, a greater number of farm severances occur. All attempts were made to minimize farm severance and locate the proposed roadway along farm property lines, where practicable. Alternative A would require right-of-way from 43 farms. Of those, **16** would be “otherwise affected” (that is, right-of-way would be required but would not result in the farm being divided into separate farm areas), and 27 farms would be severed (20 would be diagonally severed and seven would be laterally severed).

4.2.9.3 Alternative E

Because Alternative E would involve reconstruction of existing U.S. 67, most farmland acquisition would be strip takings along field edges rather than severances. (Farming along existing U.S. 67 has adapted to the roadway, which has been present for many decades.) Alternative E would require right-of-way from 59 farms. Of those, **55** would be “otherwise affected.” Another **four** farm operations would be severed (**two** would be diagonally severed and two would be laterally severed).

4.2.10 Severance Management Zones

Severance management zones are those areas of the farm adjacent to the right-of-way after being diagonally dissected. These zones are triangular in shape and cause operational or management problems for the farmer. In severance management zones, point rows are created when field rows intersect turn rows at a skew rather than right angles. These point rows are difficult to farm efficiently.

The common segment would create severance management zones to 17 properties that when combined account for approximately 850 hectares (2,100 acres) of farmland.

Alternative A would create severance management zones to 20 properties that when combined account for approximately 200 hectares (494 acres) of farmland.

Alternative E would create severance management zones for **two** properties that account for approximately **30 hectares (74 acres)** of farmland.

4.2.11 Landlocked Parcels

A landlocked area is defined as land isolated by the right-of-way rendering it inaccessible by public road, existing easement, or proposed access roads.

Along the common segment, six parcels would be landlocked. Along Alternative E, five parcels would be landlocked. No parcels would be landlocked under Alternative A.

4.2.12 Adverse Travel

Adverse travel constitutes the additional kilometers traveled by a farmer to reach a severed or otherwise affected area of land created by the proposed expressway construction. Adverse travel can also occur if right-of-way affects normal traffic patterns. Landlocked areas are not included in the measurement of adverse kilometers since they would have no access.

Adverse travel imposes costs on the owner and operator in terms of time lost, machine wear, and energy expense. Because the margin of commodity prices over production costs is small, added costs due to adverse travel can be a significant factor. In addition, increased safety risks occur when farmers must take slow machinery onto high volume roads.

Adverse travel is calculated by determining the shortest route necessary to travel from the field edge of one severed area by a public road or existing easement to the field edge of a second severed area. This distance is doubled to account for one round trip. Existing distance is also calculated for a round trip and subtracted from the new travel length. Since farmers other than the landowners farm a considerable number of the fields, adverse travel was measured from each access location. Where partial access control is required, proposed median openings would be located every 0.8 kilometer (0.5 mile). Existing residential and agricultural entrances would be right-in/right-out at all locations where a median opening does not occur. At each driveway not aligned with a median, out-of-direction travel would result.

4.2.12.1 Common Segment

Overall, access to farm fields would be largely unaltered along the common segment. Some minor changes to field access can be expected where access points may be moved or consolidated with other access points. Expressway frontage roads would also be established in some locations to accommodate farm vehicles. As a result, farmers would experience some minor changes in the way they work their fields and move from one field to another. Median openings would be provided at all public road intersections. Median openings would also be provided at other locations to allow farm implements to cross the highway. Medians would be about 15 meters (50 feet) wide, providing enough space to accommodate farm implements without blocking a highway travel lane. The average adverse travel along this segment would be 0.5 kilometers (0.3 mile).

4.2.12.2 Alternative A

Alternative A would have the greatest impact to farm access. Each property requiring access to and from U.S. 67 would be provided a new access point to the highway. Because the access points would be newly established, most farmers would need to change the way they work their fields and move equipment between them. Median openings would be provided at all road intersections and at other locations to allow median crossovers.

New driveway locations along Alternative A would tend to be located along property lines. For each farmland severance, a driveway would be required on both sides of the proposed expressway to allow farmers to cross between fields. Alternative A would result in an average adverse travel length of roughly 1.7 kilometers (1.1 miles).

4.2.12.3 Alternative E

Overall, access to farm fields would be largely unaltered by Alternative E. Some minor changes to field access can be expected where access points may be moved or consolidated with other access points. Expressway frontage roads would also be established in some locations to accommodate farm vehicles. As a result, farmers would experience some minor changes in the way they work their fields and move from one field to another. Median openings would be provided at all public road intersections. Median openings would also be provided at other locations to allow farm implements to cross the highway. Medians would be about 15 meters (50 feet) wide, providing enough space to accommodate farm implements without blocking a highway travel lane. The average adverse travel for Alternative E would be 1.5 kilometers (0.9 mile).

4.2.13 Farm Displacements

Recent aerial photos and field reconnaissance determined the number of farm buildings that require demolition, removal, or relocation due to expressway construction. These buildings include farm residences, barns, sheds, pens, bins, silos, windmills, or other structures associated with farm operations.

Along the common segment, 13 houses and 32 other structures would be displaced. Alternative A would displace six houses and 22 other structures. Alternative E would displace 24 houses and 42 other structures.

4.2.14 Agricultural Income Loss

To estimate agricultural income loss for right-of-way taken, the total number of farm hectares in each of the four counties was divided into the total farm receipts in order to obtain an average annual agricultural income loss per hectare figure. This figure was multiplied by the agricultural hectares required in each county to obtain the estimated agricultural income that would be lost under each alternative.

4.2.14.1 Common Segment

The common segment would result in an annual agricultural income loss of \$305,100. This figure represents farm production from crops (including specialty crops) and livestock. Construction may indirectly affect local businesses that supply seed, fertilizer, farm machinery, and so on to local farms. These businesses may experience a slight decline in sales as farmland is converted to roadway use.

4.2.14.2 Alternative A

Alternative A would result in an annual agricultural income loss of \$255,200. This figure represents farm production from crops (including specialty crops) and livestock. Construction may indirectly affect local businesses that supply seed, fertilizer, farm machinery, and so on to local farms. These businesses may experience a slight decline in sales as farmland is converted to roadway use.

4.2.14.3 Alternative E

Alternative E would result in an annual agricultural income loss of \$187,500. This figure represents farm production losses only; other sources of income derived from the ownership

of farms were not included in the estimate. Loss of productive agricultural land may also have an indirect effect on local businesses that supply seeds, fertilizer, farm machinery, and so on to local farms. These businesses may experience a decline in sales as farmland is converted to roadway use.

4.2.15 Drainage Effects

4.2.15.1 Surface Drainage

Throughout most of the study area, the terrain is generally level. Exceptions include two bluff areas—one north of the river on the common segment and one south of the river on Alternative A—and locations along the common segment where the corridor crosses streams and creeks. South of the Illinois River, many farmers have constructed drainageways and installed field tile systems to drain their fields. Some have also installed center-pivot operations to provide water to their fields.

There are no center-pivot operations along the common segment of the alignment. Along Alternative A, there is one center-pivot operation that would be impacted by the proposed alignment. Along Alternative E, there are two center-pivot operations that would be impacted by the proposed alignment.

The proposed U.S. 67 would be constructed a minimum of 0.9 meter (3 feet) above the 50-year flood condition. In levee protected areas, the roadway surface would be constructed 0.9 meter (3 feet) above the 100-year flood condition. Existing drainage patterns and ditch flowline elevations were taken into consideration when the proposed profile grade was selected. Storage ponds may be constructed to compensate for any reduction in available flood storage resulting from the construction of proposed U.S. 67.

4.2.15.2 Subsurface Drainage

Subsurface farm tiles are located principally in the flat or gently rolling areas along the corridor. During the acquisition process, the IDOT Bureau of Design or Bureau of Land Acquisition will schedule meetings with farmers along the rights-of-way to determine tile locations. Farm field tiles that intersect with the preferred route for the expressway will either be relocated, discharged into ditches along proposed U.S. 67, or replaced with higher strength pipe beneath U.S. 67. During construction, exploratory trenching will be done (where necessary) along the route to locate field tiles not identified during preparation of construction plans.

4.2.15.3 Erosion

Erosion control is a significant consideration in the design and construction of an expressway. To be efficient and economical, erosion control must be designed into a project from the beginning. Significant amounts of soil loss may be attributed directly to freeway construction if adequate control measures are not implemented.

The following examples of soil erosion control measures may be used in combination during the construction of proposed U.S. 67:

- Use of stabilizing vegetation

- Design of the freeway to reduce cut-and-fill slopes to the minimum required or use of larger rights-of-way to allow lesser slopes
- Use of diversions to impede the rapid flow of water
- Use of ponds and catch basins to trap sediment before it leaves the construction area
- Use of artificial or chemical stabilizers to aggregate the surface, thus preventing particle dislodgment
- Use of temporary erosion control measures during construction, such as ditch checks, silt fences, erosion blankets, and seeding of disturbed areas

Erosion control measures would be implemented throughout the project area in accordance with current IDOT policy as stated in *IDOT Joint Design/ Construction Procedure Memorandum on Erosion and Sediment Control*, and an erosion control plan will be prepared as part of the contract documents. Measures would be established to minimize soil loss and subsequent sedimentation.

Areas of special concern where erosion and sediment control are needed will be identified once the preferred alternative is selected and included in the contract plans.

4.2.15.4 Borrow Pits

Construction of either of the alternatives would require borrow material. Borrow material would be contractor furnished and would be subject to cultural and natural resource surveys prior to use.

4.3 Natural Resource Impacts

4.3.1 Geology and Soils

4.3.1.1 Bedrock Geology

There are four principal uppermost bedrock units found throughout the project area: Warsaw shale, Keokuk limestone, Tradewater formation, and Carbondale formation. Each formation is overlain by surface geology of sufficient depth that none of the bedrock units would be encountered by road construction of any of the alternative segments.

4.3.1.2 Surface Geology/Topography

The bedrock throughout the study area is overlain by glacial till materials that were deposited by the Lake Michigan Lobe of the Illinoian advance. Within the project area, loess of the Wisconsinian age is almost universally encountered across these till materials. The average depth of loess typically ranges from 3 to 5 meters (10 to 16 feet). However, deposition of loess material created a significant bluff area west of Arenzville. Alternative A crosses this bluff area and represents the most significant potential impact to surface geology and topography.

Surface geology in the bluffs area consists of deep glacial till deposits covered with loess soils to a depth of up to 35 meters (115 feet). Loess soils are wind-blown deposits, typically high in silt and sand content, that naturally stand at relatively steep slopes and may cause potential stability concerns during and after construction. These soils are also moderately to highly

compressible and may lead to appreciable settlements under structures and embankments. However, loess soils are typically suitable for standard cut backslopes or for placement as fill material in embankments. The technical stability and settlement constraints posed by these soils conditions can be overcome through appropriate design and construction techniques.

4.3.1.3 Soils

Soils that have slope of 5 to 10 percent, or higher, are considered to be highly erodible lands. Approximately 191 hectares (472 acres) of highly erodible lands occur within the project area. Areas of highly erodible lands are mainly confined to upland areas, particularly in association with bluff areas north of the Illinois River and south of the Illinois River near Arenzville. Of the total 191 hectares (472 acres) of highly erodible lands, 106 hectares (262 acres) occur along common segments, 68 hectares (168 acres) along Alternative A, and 17 hectares (42 acres) along Alternative E.

The Arenzville Bluffs area, along Alternative A, has been identified as having potential long-term operation impacts from roadway construction, including soil erosion in cut or fill sections that could increase siltation in adjacent streams (particularly Mud Creek, which is located west of the proposed roadway). The planning and design of Alternative A has considered the frailties of the loess soils through the Arenzville Bluffs, and the location of the roadway has been placed to minimize soil cuts and long-term maintenance problems including sloughing issues. The proposed alignment requires a maximum cut of 18 meters (59 feet) and a maximum fill of 19 meters (62 feet). Benching of the high cut and fill slopes is proposed where necessary to minimize soil erosion and long-term maintenance issues.

4.3.1.4 Economic Geology

None of the build alternative segments (Common, A, or E) would affect coal resources in the study area. Coal mining has occurred near the project corridors, but no areas have been identified within the limits of either corridor. Coal mining may resume in these areas if the demand for coal rises, but there are no known planned mining operations that would affect or be affected by either build alternative.

There are three petroleum pipelines within the project area: special waste Sites 8 (Amoco Oil Co.), 26 (Williams Pipeline), and 32 (Williams Pipeline). The common segment would cross Site 8 pipeline north of Rushville near Moore Road. Alternative A alignment would cross the Site 26 pipeline north of Arenzville near Hackman Cemetery. Alternative E alignment would cross Site 32 pipeline south of Beardstown between Willow Creek and Coon Run.

There are also four aboveground storage tank (AST) batteries within the project area: special waste sites 16 (Midland Minerals), 17 (Precision Production), 19 (Pfieffer Est.), and 20 (Pfieffer Est.). All of the ASTs are located in the Rushville area along the segment of the proposed U.S. 67 right-of-way that is common to both alternative alignments.

4.3.1.5 Groundwater Resources

Currently, The Illinois Environmental Protection Agency (IEPA) has not designated any sole-source aquifers in Illinois as defined by Section 1424(e) of the Safe Drinking Water Act. Therefore, the proposed project will not affect any such aquifers (**April 24, 2002 [USEPA 1999]**).

Data sources indicate that there may be potable water wells within 61 meters (200 feet) of the right-of-way for both Alternatives A and E. This threshold, however, is only relevant when new routes (drywells or borrow pits) or sources (bulk road oil or deicing salt storage facilities) of groundwater pollution are introduced. These routes or sources would not occur with the proposed project; therefore, no violation would occur for the wellhead setback requirements.

As described in Section 2.3.1.6, *Groundwater*, aquifers are best protected from contamination where uniform, relatively impermeable, silty or clayey tills greater than 6 meters (20 feet) cover impermeable bedrock. Intermediate potential for contamination of aquifers occurs where permeable bedrock is within 6 meters (20 feet) of the surface and is overlain by impermeable till. Higher potential contamination of aquifers occurs where surficial deposits are alluvium. All three conditions are estimated to occur throughout the project area. These determinations of potential aquifer contamination areas were made using a map by Berg et al. (1984) that was prepared at an extremely large scale of 1:500,000. Therefore, it is difficult to distinguish the relative differences of potential surficial aquifer contamination for the alternatives. Generally, both Alternatives A and E will transect areas ranging from high to low potential contamination. Areas with higher potential for contamination (surficial alluvium) occur in Schuyler, Cass, and Morgan counties, primarily in and around surface streams.

Highway construction impacts such as sedimentation, surficial siltation, and hydrocarbon runoff could affect groundwater quality in the uppermost aquifers in areas with a high recharge potential rating. Other potential sources of contamination include construction staging areas, road oils, and operation activities that involve the storage of pesticides and fertilizers. The potential to affect groundwater quality may be influenced by the presence of abandoned wells. According to the Illinois Groundwater Protection Act of 1987 (IGPA), “potential routes” for groundwater contamination include abandoned improperly sealed wells. Several mitigation measures would be used during construction such as filter strips and sealing private wells within the right-of-way. Private wells would be sealed in accordance with the Illinois Water Well Construction Code. Only chemically-stable borrow or fill material would be used in order to avoid any potential impacts from contaminated fill material.

During operation, overall impacts from road oils and other potential highway runoff contaminants should be minimal because the future traffic volumes are below the threshold of concern established by FHWA for potential impacts (*RD-88-006-9*). Operational activities involving pesticide or fertilizer handling should be carefully implemented to avoid any potential impacts to water resources.

4.3.2 Surface Water Resources/Water Quality

Surface water impacts would result from construction, operation, and maintenance of the proposed roadway. Development of Alternative A from Jacksonville to Macomb (Common + Alternative A segments) would require 20 water body crossings: eight in the La Moine River drainage basin, six in the Central Illinois River drainage basin, and six in the Lower Illinois River drainage basin (Table 4-10). Development of Alternative E from Jacksonville to Macomb (Common + Alternative E segments) would require 18 water body crossings: eight in the La Moine River drainage basin, six in the Central Illinois River drainage basin, and four in the Lower Illinois River drainage basin. Fifteen of these water body crossings occur in segments common to both alignments. Permits and certifications required for potential impacts to surface water resources are discussed in Section 4.14, *Permits/ Certifications*.

Any field tiles affected by the proposed roadway improvements would be restored and existing drainage maintained. During the acquisition process, after an alignment is selected, IDOT's Bureau of Design or Bureau of Land Acquisition would schedule meetings with farmers along the rights-of-way to determine tile locations. Farm field tiles that intersect the preferred expressway route will either be relocated, discharged into ditches along proposed U.S. 67, or replaced with higher strength pipe beneath U.S. 67. During construction, exploratory trenching would be done (where necessary) along the route to locate field tiles not identified during preparation of construction plans.

TABLE 4-10
Water Body Crossings

Water Resource ^a	Alignment ^b	Structure	Adjacent Lands Highly Erodible? ^c	Figure 4-2 Exhibit ^d
Lower Illinois River Drainage Basin				
Mauvaise Terre Creek	C	Bridge	Yes	Orange 2, Blue 2
Coon Run	E	Bridge	No	Orange 5/6
Willow Creek	E	Bridge	No	Orange 6
Indian Creek (site 1)	E	Bridge	No	Orange 8
Lick Branch	A	Culvert	No	Blue 3
Tributary to Mud Creek	A	Culvert	No	Blue 6
Indian Creek (site 2)	A	Bridge	No	Blue 6
Clear Creek	A	Bridge	No	Blue 8
Prairie Creek	A	Bridge	No	Blue 7
Central Illinois River Drainage Basin				
Illinois River	C	Bridge	No	Green 11
Curry Lake (York)	C	Bridge	No	Green 11
Coal Creek Ditch	C	Culvert	No	Green 12
Bluff Ditch	C	Bridge	No	Green 12
East Fork Crane Creek	C	Culvert	No	Green 13
Schuy-Rush Lake	C	Bridge	Yes	Green 14
La Moine River Drainage Basin				
Town Branch	C	Culvert	No	Green 15
Ryan Branch	C	Culvert	Yes	Green 16
West Branch of Sugar Creek	C	Culvert	No	Green 19
Horney Branch	C	Culvert	No	Green 16
Carter Creek	C	Culvert	Yes	Green 21
Grindstone Creek	C	Bridge	No	Green 22
Camp Creek	C	Bridge	No	Green 23
Troublesome Creek	C	Bridge	No	Green 24

^a There are two crossings of fingers of the Beardstown Marsh; both would be crossed on bridges

^b C = Common Segments A = Alternative A E = Alternative E

^c Highly erodible- slopes are 5-10 percent or greater

^d Crossing location shown as Figure 2-2 on designated Exhibit #

4.3.2.1 Construction Impacts to Surface Waters

Typical operations associated with roadway construction involve clearing, grading, filling, and excavation. These activities all increase the erosion potential of surface soils due to the reduction in vegetative cover and increased impervious areas resulting from compaction of soil by heavy equipment. Proper erosion control methods, according to IDOT's *Joint Design/Construction Procedure Memorandum on Erosion and Sediment Control*, would be employed to minimize erosion and sedimentation. Construction related erosion impacts would be minimized by:

- Staging construction to minimize the size of exposed areas open at the same time and the length of time each area is exposed
- Regaining existing vegetation where feasible by stripping only areas where construction would occur
- Minimizing slope steepness and length; reseeding and mulching slopes every 7 days during construction, as well as at the completion of construction
- Employing temporary erosion control measures such as hay bales, silt fences, etc.

Highway stream crossings for the two build alternatives would involve removing and replacing or extending existing structures. Crossing streams requires in-stream work that may cause an increase in turbidity and sedimentation, and temporarily alter downstream hydraulics and substrate conditions. Any long-term increases in suspended sediments can reduce aquatic productivity by limiting photosynthesis, lowering oxygen levels, and covering food sources and fish spawning areas. In-stream bridge and culvert construction creates localized, permanent changes in habitat. However, habitat is generally impacted only in small areas and these impacts may be relatively minor when the entire stream reach is considered. Many of the stream crossings required for expansion of U.S. 67 will occur at locations with existing structures, further minimizing impacts to stream habitat.

Construction in or near waterways will be performed in accordance with Section 107.01 of IDOT's *Standard Specifications for Road and Bridge Construction*. State-of-the-art erosion control devices will be installed before erosion prone construction activities begin. Construction at stream crossings would be conducted during low or normal flow periods. Temporary and permanent erosion control methods may include silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, rip-rap of exposed embankments, erosion mats, and mulching. The application of these mitigation measures would reduce the effects of turbidity and sedimentation upon streams and creeks to minor short-term levels.

Common Segment. Fifteen water bodies would be crossed by common segments of the U.S. 67 expansion project (Table 4-10, Figure 4-2). Eight would require bridge construction and seven would be achieved using culverts. Most of these water body crossings occur at locations nearby to existing U.S. 67 structures (bridges/culverts) and would involve replacing or extending existing structures. Crossings for Town Branch, Horney Branch, and Ryan Branch along the Rushville bypass and Grindstone Creek along the Industry bypass would occur at locations where there are no existing structures.

As mentioned above, the major short-term water quality impacts due to construction are increases in turbidity and sedimentation resulting from erosion of disturbed areas and in-stream work. The surrounding soils at four waterbodies along common segments have been classified as highly erodible lands: Mauvaise Terre Creek, Schuy-Rush Lake, Ryan Branch, and Carter Creek. However, potential impacts to these water resources will be minimized using proper construction and erosion control techniques.

There are eight notable waterbody crossings along common segments of the U.S. 67 expansion project: Grindstone Creek, West Branch of Sugar Creek, East Fork of Crane Creek, Horney Branch, and Mauvaise Terre Creek due to their habitat quality designations, and associated impacts to floodplain wetlands and significant botanical sites; Schuy-Rush Lake, a regional park, due to the impact to a “significant public water” and to associated wetlands and wildlife habitat areas; and Illinois River and Curry Lake because of the magnitude of the crossing and associated wetland impacts.

Expansion of U.S. 67 would involve construction of a new bridge and demolition of the existing bridge at the Illinois River/Curry Lake crossing. Demolition of the existing bridge would most likely require the use of explosives and felling the structure into the river, where the debris would then be collected and disposed. Due to environmental concerns regarding water quality of the river, a combination of measures would likely be used:

- Protective shielding could be used during deck removal to prevent debris from falling to the area beneath the bridge.
- The truss span demolition could be accomplished by “floating out” the spans on barges with the deck cut out and removed in sections. This would require barges with scaffolding systems to be floated in so supports could be jacked into place during the dismantling of the trusses.
- Girders could be field cut at designated locations for stability during demolition and lifted out individually or as a section.
- A temporary trestle could be constructed adjacent to the existing structure. Dismantling and removal of the deck and girders could then be accomplished from the trestle.
- Substructures would generally be removed to at least 0.3 meter (1 foot) below the proposed ground line. Cofferdams, like those used for pier construction, could be used to access the existing piers and to minimize disturbance to the river bottom.

During construction of the new bridge, in-stream pier construction and abutment construction at the river’s edge have the potential for erosion and sedimentation. Scour around piers can alter stream bottom characteristics. Implementation of strict erosion control measures and other construction techniques would minimize erosion and sedimentation to the extent practicable. These measures would include cofferdams and sheet piling for pier and abutment construction; replacement of rip-rap along abutments, exposed streambank areas, and around piers; silt fence, seeding of disturbed bank areas every 7 days during construction, as well as at the completion of construction; and other temporary and permanent erosion control devices. As required in Section 107.01 of IDOT’s *Standard Specifications for Road and Bridge Construction*, contractors constructing the U.S. 67

Illinois River crossing would at all times observe and comply with all federal and state laws, local ordinances, and regulations that affect the conduct of the work.

Alternative A. Five streams would be crossed by Alternative A (Table 4-10, Figure 4-2). Three of these crossings would require bridge construction (Indian Creek, Prairie Creek, and Clear Creek), and two would be achieved using culverts (Lick Branch and Tributary to Mud Creek). All of these water body crossings would occur at locations where there are no existing structures (bridges/culverts).

Habitat quality for all of these streams has been classified as “poor.” Crossings for Tributary of Mud Creek, Indian Creek, and Prairie Creek would include impacts to adjacent farmed wetland areas. None of the soils surrounding these waterbodies have been classified as highly erodible lands.

Alternative E. Three streams would be crossed by Alternative E; Coon Run, Willow Creek, and Indian Creek, (Table 4-10, Figure 4-2). All of these water body crossings occur at locations near existing U.S. 67 structures (bridges/culverts) and would involve replacing existing structures with new bridges.

Habitat quality is “fair” for Coon Run and “poor” for Willow Creek and Indian Creek. None of the soils surrounding these waterbodies have been classified as highly erodible lands.

4.3.2.2 Navigational Impacts to Surface Waters

The Illinois Waterway is a heavily used freight pathway with approximately 163 ports. In this region of the Illinois River, there are ports in both Meredosia and Beardstown. The primary vessel usage of the waterway is dry cargo. There are approximately 13.9 million tons of commodities that are transported upbound on the Illinois River through Beardstown, while almost 19.7 million tons are transported downbound. On the upbound trip, the primary commodities transported through Beardstown include coal lignite (1.47 million tons) and cement and concrete (1.28 million tons). However, on the downbound trip, the primary commodity transported through Beardstown is corn (9.2 million tons).

Information obtained from the USACOE Waterborne Commerce Statistics Center in New Orleans "Passed the Point" software program indicates that the annual number of self-propelled vessels at Beardstown is 3,530. The number of non-self-propelled vessels (barges) at Beardstown is 30,849. The majority of loaded barges in the waterway are barges with a loaded draft of either 8.00 feet or 9.00 feet. The typical loaded barge configuration is five barges in width and five barges in length with one tow boat where the barges are 35 feet by 200 feet and the towboat is 54 feet by 195 feet.

Vessels engaged in emergency operations, national defense activities, and channel maintenance will be able to operate in the Illinois River throughout the proposed project site both during construction and after the new bridge is built.

In addition, there will be no change in the present and prospective ability of recreational craft to navigate in this portion of the Illinois River. Fishing boats, yachts, and outboard motor boats will still be able to traverse the Illinois River at the proposed project location. Also, access to local service facilities such as repair shops, parts distributors, fuel stations, and harbors of refuge would not be prohibited by the proposed bridge.

All vessels would be able to pass the proposed bridge. The U.S. Coast Guard indicated that minimum horizontal clearances required for this project over the Illinois River is 19 meters (63 feet) above normal pool stage for the main span. The main channel span of the river crossing is required to have a minimum horizontal navigation opening of 91 meters (300 feet).

In summary, even though the Illinois River is frequently used to move freight, that movement would not be disrupted, and shipping would be able to continue during the construction and operational phase of the project.

4.3.2.3 Bridge Impacts

The Illinois River and adjacent wetlands would be the most notable water resource traversed by the proposed U.S. 67 improvements. The Illinois River would be crossed over by a new bridge requiring in-stream piers, abutments, and embankments. The bridge would cross over Curry Lake, an island between Curry Lake and the Illinois River, and the Illinois River. The overall length of the bridge is 1,200 meters (3,937 feet) with 350 meters (1,148 feet) crossing Curry Lake, 250 meters (820 feet) crossing the island, and 600 meters (1,969 feet) crossing the Illinois River. The bridge would be 30 meters wide (98 feet wide) and would be supported by 16 piers. The bridge piers would occupy a total area of 0.16 ha (0.40 ac) in Curry Lake, 0.05 ha (0.12 ac) on the island (forested wetlands), 0.06 ha (0.15 ac) in the Illinois River, and 0.09 ha (0.22 ac) on the south bank (forested wetlands).

The existing bridge structure crossing over the Illinois River would be demolished. The actual method of demolition will be determined in later phases of project development. The alternative methods of demolition will be coordinated with the appropriate resource and regulatory agencies to address water quality and navigational issues.

The new bridge crossing would have the potential to impact contiguous forested wetland communities. These type of habitat support a variety of plant communities and wildlife. Restricting the placement of bridge footings and using bridge spans to the greatest extent (as opposed to fill) would further minimize impacts. Additionally, the barrier effect sometimes created by new roadways and structures would be substantially reduced by an elevated structure at the Illinois River that would impede neither wildlife movement nor water flows.

The project construction in the Illinois River and Curry Lake would result in the burial and loss of some benthic organisms. A localized, short-term and minor reduction in benthos production due to the potential for erosion and sedimentation is possible. Implementation of strict erosion control measures and other construction techniques would minimize the extent of these impacts to benthic organisms and water quality. These measures are outlined in Section 4.19 - *Mitigation Measures and Commitments*.

The only potentially impacted endangered species near the bridge crossing would be the Illinois chorus frog (state threatened). The site impacted would be north of the U.S. 67/6th Street intersection, and south of the Illinois River. The chorus (approximately 100 frogs) would be affected by the construction of approach lanes to the new bridge.

Potential impacts to surface and groundwater resources would be minimal. No known water supply wells exist near the proposed project right-of-way for the new crossing. The impacts to the already-degraded surface water quality would be minor.

4.3.2.4 Operational Impacts to Surface Waters

Operational impacts of the project on water quality in the receiving waters result from stormwater runoff from highway surfaces, median areas, and adjoining rights-of-way. The increase in impervious area increases stormwater runoff volumes and can increase in-stream erosion. Additionally, the runoff carries pollutants that have accumulated as a result of roadway use, natural contributions, deicing materials, herbicide spraying, and deposition of air pollutants. Pollutants could include solids, heavy metals, oil and grease, bacteria, herbicides, and nutrients. With correct application practices and stormwater management measures in place to intercept the runoff, the impacts of in-stream erosion and pollutants can be reduced.

The significance of stormwater runoff impacts on receiving waters depends very much on the site, application practices, and on the characteristics of the receiving waters. The potential for stormwater runoff to impact the stream is greatest at locations that directly discharge to waterways. In locations other than stream crossings, the proposed roadway would include wide grass medians, clear zones, vegetated drainage ditches, and sediment/detention basins that would attenuate the effects of stormwater runoff. An effort would be made to locate detention basins on landlocked parcels, uneconomic farm remnants, or on less productive farmland.

Studies by the FHWA and various states including Michigan indicate that pollutants in highway runoff are not present in amounts sufficient to threaten surface water or groundwater quality where the average daily traffic (ADT) is less than 30,000. Recent research by FHWA (*RD-88-006-9*) concluded that paved roadways with ADT under 30,000 had only minor impacts, if any, on the water quality of the receiving waters. Future forecasted traffic for U.S. 67 (5,000 to 17,400 vpd for the design year 2030) are well below this threshold. Therefore, the potential impacts for both build alternatives would be expected to be minor. Potential impacts would generally be short-term, localized acute loadings, with few, if any, chronic effects.

Potential operation impacts to surface waters may be greater for Alternative A, as this alternative involves construction of a new highway alignment as well as maintaining the existing alignment.

4.3.2.5 Maintenance Impacts

Normal maintenance procedures include the seasonal use of roadway deicing agents (normally salt). Deicing salts can affect water quality by increasing the chloride levels during runoff and snowmelt. Impacts are associated with salt movement away from the proposed roadway. Salt flows into drainage ditches and travels to waterways. Salt spray from moving traffic drifts as a mist and deposits on nearby vegetation and soils. Deicing salts are used as needed during the winter months. Past application rates have varied widely, primarily due to weather conditions and deicing material. Future application should vary similarly. Water quality analysis for project area streams indicated that current deicing practices have not significantly impacted water quality. No streams had chloride

concentrations that exceeded the IEPA Water Quality Standard (500 mg/L) during any of the five monitoring events. The five monitoring events were conducted during all seasons of the year and did not detect any seasonal increases in chloride concentrations. No stream had an average chloride concentration for the five monitoring events above 125 mg/L or 25 percent of the IEPA Water Quality Standard.

The proposed build alternatives would increase the number of lane miles in the project area, thereby increasing the total salt loading over current levels. This could result in an increase in the delivery of sodium chloride ions to receiving surface water. Research shows that occasional high levels of chlorides do occur in drainage ditches and waterways due to rapid runoff and snowmelt. The research also indicates, however, no long-term buildup of chlorides occurs in waterways due to regular salt applications in the winter months. Studies by the U.S. Geological Survey (USGS) (Research Project R-18-0) of sodium chloride concentrations originating from highway runoff have shown that the additional input of sodium chloride ions from deicing salts would be offset by a proportional increase in runoff for dilution.

Control of nuisance and noxious weeds along the highway right-of-way typically requires application of herbicides. The proposed build alternatives would increase the right-of-way area and, possibly, increase the volume to herbicide applied. Incorrect application practices and surface water runoff can transport these herbicides to receiving waters. However, correct application practices and natural attenuation that occurs in the soils and drainage ditches can minimize the amount of herbicide reaching surface waters.

Potential maintenance impacts to surface waters may be greater for Alternative A, as this alternative involves construction of a new highway alignment as well as maintaining the existing alignment.

4.3.3 Wetlands

There are three federal and state wetland regulations that protect the wetland resources (also, see Section 4.14, *Permits and Certifications*):

- Section 404 of the Clean Water Act (CWA) requires that a permit be obtained before filling can occur in portions of wetlands important for interstate commerce. Section 404 also requires that unavoidable wetland impacts be minimized and mitigated.
- Presidential Executive Order 11990 on Protection of Wetlands requires federal agencies to avoid, to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, the Order directs federal agencies to avoid construction in wetlands unless there is no reasonable alternative, and states that where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to the wetlands.
- The Illinois Interagency Wetlands Policy Act of 1989 (IWPA) mandates no statewide net loss of wetland acres or functional values that would result from state agency actions. Development of agency action plans and wetland mitigation policy are provisions required by IWPA.

In accordance with Executive Order 11990, the IWPA, and various state and federal agency policies and mandates for wetland preservation, the following discussion

provides a summary of wetland impacts for the proposed project. Compliant with these various regulations, the Illinois Department of Transportation has prepared a detailed *Wetland Technical Report – 1999* (separate report), a Section 404(b)(1) Evaluation Report (Appendix M), and a determination that there is no practicable alternative to adverse wetland impacts (Section 4.3.3.5 - *Wetlands – Only Practicable Alternative Finding*). These documents were submitted for review by appropriate state and federal agencies. The agency coordination culminated with their unanimous agreement that Alternative E was the preferred alternative with the least environmental damage under the Statewide Implementation Agreement (SIA) for Concurrent National Environmental Policy Act (NEPA)/404 Process – see Section 5.3.

4.3.3.1 Overview of Impacts from Jacksonville to Macomb

Direct wetland impacts from the proposed U.S. 67 project are discussed in this section. Direct impacts would result in wetland loss through activities such as the placement of fill during construction. Direct impacts also include the “unfilled” portions of wetlands where only a small portion remains unfilled. For example, if approximately 0.7 hectare (1.7 acres) of a 1.0 hectare (2.5 acre) wetland is to be filled during construction, the remaining 0.30 hectare (0.74 acre) is considered a direct impact. If the remaining portion of the wetland outside of the 'footprint' is large and can still function as a wetland, it is not considered as part of the direct impact.

Table 4-11 summarizes direct wetland impacts by alternative and wetland type. Alternative A from Jacksonville to Macomb (Common + Alternative A alignments) would result in total direct wetland impacts of 16.27 hectares (40.17 acres). Alternative E from Jacksonville to Macomb (Common + Alternative E alignments) would result in total direct wetland impacts of 13.02 hectares (32.14 acres). For both alignments, impacts to Palustrine Emergent Wetlands (PEM) would be greatest, followed by Palustrine Forested Wetlands (PFO1). Proposed construction would affect some farmed wetlands and a small number of Palustrine Unconsolidated Bottom (PUB) sites. Almost half of all projected wetland impacts would occur within the Beardstown Marsh and Illinois River Area along a segment common to both alignments. Wetland details, including impacts and compensation, are summarized in Appendix J.

TABLE 4-11
Direct Wetland Impacts for Each Alternative (from Jacksonville to Macomb)

Wetland Classifications *	Alternative A from Jacksonville to Macomb (Common + Alternative A alignments)	Alternative E from Jacksonville to Macomb (Common + Alternative E alignments)
PEM	7.51 ha (18.54 ac)	7.20 ha (17.78 ac)
PF01	5.25 ha (12.96 ac)	5.34 ha (13.18 ac)
PUB	0.09 ha (0.22 ac)	0.08 ha (0.20 ac)
Farmed Wetland (FW)	3.02 ha (7.47 ac)	0.0 ha (0.0 ac)
Other	0.40 ha (0.98 ac)	0.40 ha (0.98 ac)
Total	16.27 ha (40.17 ac)	13.02 ha (32.14 ac)

TABLE 4-11

Direct Wetland Impacts for Each Alternative (from Jacksonville to Macomb)

* Per Cowardin et al. 1979

PEM – Palustrine Emergent Wetland

PFO1 – Palustrine Forested Wetland

PUB – Palustrine Unconsolidated Bottom Wetland

4.3.3.2 Common Segment

Direct wetland impacts within common segments of the proposed improvements to U.S. 67 are summarized in Table 4-12. Approximately 12.78 hectares (31.55 acres) of wetlands will be directly impacted during roadway improvements to common segments.

TABLE 4-12
Wetland Impacts Along Common Segments

Wetland ID # ^a	Wetland Classification ^b	Total Area of Wetland - ha (ac)	Estimated Direct Impact - ha (ac)	Figure 4-2 Exhibit ^c
1	PEM	7.59 (18.75)	0.64 (1.57)	Green 11
8	other	32.81 (81.07)	0.40 (0.98)	Green 11
18	PFO1	0.90 (2.22)	0.89 (2.20)	Green 11
19	PEM	6.05 (14.95)	1.83 (4.52)	Green 11
20	PFO1	0.31 (0.77)	0.00 (0.01)	Green 11
28	PFO1	17.98 (44.43)	1.09 (2.70)	Green 11
30	PFO1	2.42 (5.99)	1.13 (2.79)	Green 11
31	PFO1	54.02 (133.48)	1.96 (4.84)	Green 11
33	PEM	2.31 (5.71)	0.28 (0.69)	Green 11
39	PUB	0.27 (0.66)	0.03 (0.08)	Green 12
46	PEM	1.70 (4.20)	0.32 (0.78)	Green 14
49	PEM	0.32 (0.80)	0.01 (0.01)	Green 13
80	PFO1	0.14 (0.34)	0.04 (0.10)	Green 13
91	PFO1	0.89 (2.20)	0.09 (0.23)	Blue 2, Orange 2
93	PEM	4.42 (10.93)	1.88 (4.63)	Blue 2, Orange 2
94	PEM	0.58 (1.43)	0.26 (0.64)	Blue 2, Orange 2
120	PEM	0.57 (1.40)	0.15 (0.37)	Green 23
122	PEM	0.08 (0.19)	0.11 (0.27)	Green 23
128	PEM	0.48 (1.19)	0.48 (1.19)	Green 22
143	PUB	0.04 (0.10)	0.05 (0.12)	Green 21
146	PFO1	0.05 (0.12)	0.01 (0.03)	Green 21
149	PFO1	0.15 (0.37)	0.02 (0.06)	Green 19
AD3-1	PEM	0.59 (1.46)	0.59 (1.46)	Green 15
AD3-3	PEM	0.41 (1.01)	0.41 (1.01)	Green 16
AD3-4	PEM	0.06 (0.15)	0.06 (0.14)	Green 16
AD3-5	PEM	0.69 (1.70)	0.03 (0.07)	Green 16
AD3-6	PEM	0.06 (0.15)	0.02 (0.04)	Green 16
Total		135.89 (335.77)	12.78 (31.55)	

^a Wetland ID number for reference to Appendix J

^b Per Cowardin et al. 1979

^c Location shown as Figure 4-2 on designated Exhibit #

PEM – Palustrine Emergent Wetland

PFO1 – Palustrine Forested Wetland

PUB – Palustrine Unconsolidated Bottom Wetland

There are four notable wetland areas along common segments that would be partially impacted: Mauvaise Terre Creek and associated floodplain, Beardstown Marsh, the Illinois River and associated floodplain, and Schuy-Rush Lake. Detailed descriptions of these resources are provided in Section 2.3.3.3, *Wetland Complexes in the Project Area*. Potential impacts to these wetland resources are discussed below.

Mauvaise Terre Creek (Sites 91, 93, 94). Mauvaise Terre Creek crosses U.S. 67 east of Chapin in Morgan County. Proposed road improvements at the Mauvaise Terre Creek crossing would impact 2.23 hectares (5.50 acres) of wetlands, of which 0.09 hectare (0.23 acre) is palustrine forested wetlands and 2.14 hectares (5.27 acres) is palustrine emergent wetlands. The proposed corridor crosses the creek at the existing bridge to minimize impacts to forested wetland. Figure 4-2: Blue 2 and Orange 2 show the location of the Mauvaise Terre Creek wetlands in relation to the proposed road alternatives.

Beardstown Marsh (Sites 1, 8, 18, 19, 20). The Beardstown Marsh Natural Area would be directly impacted by the proposed improvements to U.S. 67. **The total size of the Beardstown Marsh Natural Area is 189 hectares (468 acres); about 1.0 hectare (2.44 acres) would be directly impacted (this is discussed further in Section 4.3.5.4, *Illinois Natural Areas*), and 0.60 hectares (1.50 acres) would be severed from the natural area; therefore, indirectly impacted. The total impact to the Beardstown Marsh Natural Area is estimated to be 1.60 hectares (3.94 acres). Further,** approximately 3.76 hectares (9.28 acres) of surrounding wetland (**not part of the Natural Area**) would be impacted by proposed improvements. Figure 4-2: Blue 9, Orange 10, and Green 11 show the location of the Beardstown Marsh Complex and its relation to proposed road alternatives.

Illinois River (Sites 28, 30, 31, 33). At the Illinois River crossing, roadway and bridge construction would affect 4.46 hectares (11.02 acres) of seasonally flooded floodplain forest and associated emergent wetland. Impacts associated with bridge construction would be temporary, or could take the form of a conversion of wetland type. Permanently affected areas would be limited to the placement of bridge footings or other support structures. Other wetland areas under the elevated bridge structure would be restored or converted from forested to emergent/scrub-shrub types. Figure 4-2: Green 11 shows the location of the Illinois River wetlands in relation to the proposed road alternatives.

Schuy-Rush Lake (Site 46). Approximately 0.32 hectare (0.78 acre) of wetlands associated with Schuy-Rush Lake would be impacted by proposed improvements to U.S. 67. The current expressway design uses the existing bridge crossing, thereby avoiding disturbance at a new location. Similar to the Illinois River crossing, some wetland impacts may be limited to temporary disturbance or conversion of forested areas, to scrub/shrub and emergent communities. Figure 4-2: Green 14 shows the location of Schuy-Rush Lake in relation to the proposed road alternatives.

4.3.3.3 Alternative A

Wetland impacts along Alternative A of the proposed improvements to U.S. 67 are summarized in Table 4-13. Approximately 3.49 hectares (8.62 acres) of wetlands would be impacted along Alternative A. Impacts to emergent wetlands and Natural Resource Conservation Service- (NRCS)-identified farmed wetland areas comprise most of these

projected impacts. Notable wetlands potentially impacted along Alternative A include sand ponds of the Sanitary Landfill area.

TABLE 4-13
Wetland Impacts Along Alternative A

Wetland ID # ^a	Wetland Classification ^b	Total Area of Wetland ha (ac)	Estimated Direct Impact ha (ac)	Figure 4-2 Exhibit ^c
AD1-1	PEM	3.2 (7.91)	0.02 (0.04)	Blue 8
AD1-3	PEM	0.44 (1.09)	0.44 (1.09)	Blue 8
62	PUB	0.07 (0.17)	0.01 (0.02)	Blue 9
AD2 NRCS 1	Farmed Wetland	0.98 (2.42)	0.67 (1.65)	Blue 6
AD2 NRCS 2	Farmed Wetland	1.68 (4.15)	0.54 (1.34)	Blue 6
AD2 NRCS 3	Farmed Wetland	1.23 (3.04)	0.37 (0.92)	Blue 7
AD2 NRCS 4	Farmed Wetland	3.38 (8.35)	0.58 (1.43)	Blue 7
AD2 NRCS 5	Farmed Wetland	2.91 (7.19)	0.46 (1.13)	Blue 7
AD2 NRCS 6	Farmed Wetland	0.69 (1.70)	0.41 (1.00)	Blue 9
Total		14.58 (36.02)	3.49 (8.62)	

^a Wetland ID number for reference to Appendix J

PEM – Palustrine Emergent Wetland

^b Per Cowardin et al. 1979

PUB – Palustrine Unconsolidated Bottom Wetland

^c Location shown as Figure 4-2 on designated Exhibit #

Farmed Wetlands – Determined by NRCS

Sanitary Landfill Area (Sites AD1-1, AD1-3). Impacts to sand ponds along Alternative A would be limited to those involving two sites. Impacts to these two sand ponds would total 0.46 hectare (1.13 acres). Only a small part of site AD1-1 would be affected, whereas almost all of site AD1-3 would be lost due to construction. Site AD1-3 is characterized as a sand pond of statewide significance, partly because of the presence of the threatened Hall's bulrush and Illinois chorus frog. Figure 4-2: Blue 8 shows the location of the sanitary landfill in relation to the proposed road alternatives.

4.3.3.4 Alternative E

Wetland impacts along Alternative E of the proposed improvements to U.S. 67 are summarized in Table 4-14. Approximately 0.24 hectare (0.59 acre) of wetlands would be impacted along the proposed Alternative E. Notable wetland areas along the Alternative E alignment occur south of Indian Creek.

TABLE 4-14
Wetland Impacts Along Alternative E

Wetland ID # ^a	Wetland Classification ^b	Total Area of Wetland ha (ac)	Estimated Direct Impact ha (ac)	Figure 4-2 Exhibit ^c
160	PFO1	0.19 (0.46)	0.09 (0.22)	Orange 8
161	PEM	0.40 (0.99)	0.07 (0.17)	Orange 8
163	PEM	0.21 (0.52)	0.08 (0.20)	Orange 8
		0.80 (1.97)	0.24 (0.59)	

^a Wetland ID number for reference to Appendix J

^b Per Cowardin et al. 1979

^c Location shown as Figure 4-2 on designated Exhibit #

PEM – Palustrine Emergent Wetland

PUB – Palustrine Unconsolidated Bottom Wetland

Farmed Wetlands – Determined by NRCS

Indian Creek (Sites 161, 163). Two notable wetland sites south of Indian Creek would be affected by of Alternative E. These sites are characterized as spring fed marshes disturbed by previous trenching. Site 163 supports Hall's bulrush, a state listed species. Direct impacts are 0.07 hectare (0.17 acre) for Site 161 and 0.08 hectare (0.20 acre) for Site 163. Road construction may alter wetland hydrology beyond the fill areas, but proper culvert sizing would limit the extent of any additional wetland impacts. Figure 4-2: Orange 8 shows the location of Indian Creek wetlands in relation to the proposed roadway alignment.

4.3.3.5 Wetlands – Only Practicable Alternative Finding

This section summarizes the wetland impacts of the selected alternatives and describes the basis for the determination that there is no practicable alternative to adverse wetland impacts. This section also describes measures to minimize adverse wetland impacts.

Basis for Finding. Presidential Executive Order 11990, Protection of Wetlands, requires federal agencies to avoid to the extent practicable long and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, the Order directs federal agencies to avoid new construction in wetlands unless there is no practicable alternative and, where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands. The following information sets forth the basis for a finding of no practicable alternative to wetland impacts associated with the IDOT's recommended alternative improvements, and to demonstrate the proposed improvements will include all practicable measures to minimize harm to affected wetlands.

Alternatives. Wetlands are scattered throughout the project area. The greatest and most significant wetland impact occurs within the Beardstown Marsh and Illinois River Area along a segment common to both alignments. However, most other impacts are small and isolated, and all of the alternatives considered in the project would affect wetlands. Two build alternatives (Alternative A and Alternative E) and a No-Build Alternative were evaluated in detail in the Draft EIS. An objective of the alternatives development and refinement process was to minimize the amount of wetland loss and to be certain potential impacts could be mitigated in instances where wetland impacts are unavoidable.

No-Build Alternative. The No-Build Alternative is defined as no new major construction. Improvements implemented under this alternative would be limited to short-term restoration activities (maintenance improvements) needed to ensure continued use of U.S. 67 between Jacksonville and Macomb. The design of the existing roadway, including location, geometric features, and current capacity limitations, would remain unchanged. Under this alternative, some minor improvements could be anticipated at high volume intersections. Generally, there would be no need for any additional right-of-way for the No-Build Alternative.

Under the No-Build Alternative, committed improvements (as detailed in the 1998-2002 Highway Improvement Program) would still be undertaken. Committed improvements include resurfacing, intersection improvements at U.S. 67 and its intersection with IL 100/IL 104, and rehabilitation of the bridge over Mauvaise Terre Creek on U.S. 67.

Build Alternative. The preferred alternative (Alternative E) is described in detail in Section 3, Alternatives. This alternative would provide a 4-lane divided roadway with partial-access control between Jacksonville on the south and U.S. 136 near Macomb on the north. Alternative E would require 13.02 hectares (32.14 acres) of wetland. A description of the functions and impacts associated with the preferred alternative is found in Section 4.3.3.

Determination of No Practicable Alternative. Alternative E was selected as the only practicable alternative based on engineering and environmental evaluation and public input. IDOT selected Alternative E after careful consideration of all factors weighing on the decision. IDOT selected Alternative E because it provides the best long-term service for the project area, and the statewide network, while minimizing impacts to important environmental resources. Overall, Alternative E has the least wetland impact, least agricultural land impact, least impact to special habitat and threatened and endangered species, and the least number of water bodies crossed. Alternative E also received the most favorable public support from both the general public at large and the communities located along the corridor.

No-Build Alternative. The No-Build Alternative was eliminated from consideration because it would fail to meet the project's purpose and need objectives. The key reasons are summarized as follows:

- The No-Build Alternative would not improve travel speed through the area, relieve congestion points, nor improve safety conditions.
- The No-Build Alternative would not improve the transportation continuity or enhance the economic stability of the area. This alternative would represent a departure in roadway type, which has been planned for the U.S. 67 corridor extending from the Quad Cities to Alton. The No-Build Alternative would not provide a uniform, efficient, and reliable facility; therefore, it would not provide a competitive advantage to the region for economic development.
- The No-Build Alternative would not improve rural access in the project area. This alternative would not change access and travel times to critical destinations such as emergency services, schools, community and medical services, and work

centers. Thus, this alternative fails to meet the essential travel and safety needs of rural residents.

Alternative A. Although, Alternative A would satisfy the transportation objectives of the proposed action, it was not selected as the preferred alternative. The key reasons for not selecting Alternative A include the following:

- Alternative A would impact about 3 hectares (8 acres) more wetlands than Alternative E.
- Alternative A would require more agricultural land (about 61 hectares or 150 acres) than Alternative E, and would sever 70% more farms.
- Alternative A would impact more sensitive habitat including Sand Prairie and Loess Hill Prairie, and would encounter a greater number of threatened and endangered species.
- Comments from agencies, the general public, and local communities were not in favor of Alternative A.

Summary. Alternative E satisfies the transportation objective set out in the Purpose and Need section of the Final EIS. Although, Alternative E has slightly greater social impact (more displacements) it has far fewer impacts to important environmental resources. Compared to other alternatives, Alternative E would be the least environmentally-damaging alternative.

Measures to Minimize Harm.

Avoid and Minimize Wetland Impacts. The wetlands in the project area are broadly scattered which makes it impractical for any alternative to avoid wetlands. During the early phases of the project, wetlands were mapped and used as constraints in the development and layout of alternatives. Thus, to the extent practicable, wetlands, other natural plant communities, and listed species were avoided. Complete avoidance of these resources, however, was impossible. Unavoidable impacts would be minimized with road design considerations such as:

- Increasing road embankment slopes to minimize the size of the roadway footprint in fill areas.
- Increasing the slope of cut areas with stepped retaining walls to reduce the extent of earthmoving in sensitive areas.
- Incorporating Best Management Practices such as erosion control with properly installed and maintained silt fences and rapid re-vegetation with native plant species.

Wetland Compensation. Compensation of unavoidable wetland impacts through restoration or creation will be undertaken to offset projected losses. The mitigation ratio for each potential wetland impact for the U.S. 67 project is based on the approved IDOT Wetlands Action Plan. The project constitutes a Standard Review Action that has to be coordinated with the IDNR and for which project-specific compensation criteria would be met. The IDOT Procedures Memorandum provides preliminary compensation ratios based on the level of wetland impact and the

location of wetland compensation with respect to impact locations. Preliminary wetland compensation goals have been developed for the U.S. 67 project following guidelines regarding replacement and sequencing stated in the Illinois Interagency Wetland Policy Act. Generally, the rule establishes replacement requirements that vary depending on whether mitigation occurs onsite, offsite (in-basin), or offsite (out-of-basin). Other factors, such as the presence of state or federal listed species, classification as an Illinois Natural Area, or an FQI score of greater than or equal to 20, also determine compensation goals.

Wetland impacts occur within three drainage basins and involve several wetland types. Some wetland areas also contain state and federal listed species, which may be affected directly or indirectly.

Preliminary wetland compensation goals for the U.S. 67 project are as follows:

- In-kind wetland compensation will be provided on the basis of wetland function and type classification (per Cowardin et al. 1979).**
- Individual wetland impacts less than 1.2 hectares (0.5 acre) in size will be mitigated at a ratio of 1.5 to 1 (onsite), 2.0 to 1 offsite (in-basin), and 3.0 to 1 offsite (out-of-basin).**
- Individual wetland impacts greater than 1.2 hectares (0.5 acre) in size will be mitigated at a ratio of 2.5 to 1 (onsite), 4.0 to 1 offsite (in-basin), and 5.5 to 1 offsite (out-of-basin).**
- Wetlands that contain a state or federally listed species will be compensated in-kind at a ratio of 5.5 to 1.**
- Sites that have been designated as state natural areas or have an FQI score greater than 20 will be compensated at a ratio of 5.5 to 1.**

The projected compensation area is based on the proposed wetland goals, which establish compensation ratios based on wetland type, compensation location, and other factors. A total compensation area of 56.69 hectares (140.07 acres) is estimated for Alternative E from Jacksonville to Macomb.

The above compensation needs are based on total wetland impacts and assume that the mitigation site will be the La Grange Wetland Bank, Brown County, Illinois. All potential wetland impacts south of the Illinois River were considered to be in the offsite (in-basin) compensation category. All impacts north of the Illinois River were considered to be in the offsite (out-of-basin) compensation category.

The IDOT is proposing to mitigate the project's wetland impacts at the LaGrange Wetland Bank. The site is located at the northeast corner of Brown County, Illinois, and is currently under development. The property is approximately 666 hectares (1,645 acres) in size and under the ownership of the state. The site is located approximately 4.8 kilometers (3 miles) southwest of Beardstown. The LaMoine River forms the sites northern boundary and the Illinois River forms its eastern boundary.

Due to the site conditions, the La Grange Wetland Bank is an excellent candidate site for conducting a large-scale wetland restoration for the purpose of providing

wetland mitigation for IDOT projects. The site contains the federal threatened decurrent false aster (*Boltonia decurrens*) and receives heavy usage from a number of shore birds, wading birds, and waterfowl.

Wetland Finding. Based on the above considerations, in accordance with Presidential Executive Order 11990, Protection of Wetlands, it is determined that there is no practicable alternative to the proposed construction in wetlands. The preferred alternative (Alternative E) includes all practicable measures to minimize harm to wetlands that may result from such use.

4.3.4 Floodplains

The proposed project was reviewed in accordance with Executive Order 11988 “Floodplain Management;” Section 6-261, “Floodplains” in the IDOT Bureau of **Design** and Environment (BDE) Manual of Policies and Procedures (Volume I); and BLE Procedure Memorandum No. 95-3.

Development of Alternative A from Jacksonville to Macomb (Common + Alternative A alignments) would require crossings for 10 designated 100-year floodplains (Table 4-15). Development of Alternative E from Jacksonville to Macomb (Common + Alternative E alignments) would also require crossings for 10 designated 100-year floodplains. Six of these 100-year floodplain encroachments occur in segments common to both alignments. A portion of the encroachment on Illinois River floodplain occurs in a segment common to both alignments, beginning where the alternative alignments converge near Drainage Road (south of Beardstown) and continuing north across the Illinois River. Encroachments on the Illinois River floodplain are further discussed below in the section for “Common Segment” and in the section for “Alternative E,” where additional impacts would occur.

The No-Build Alternative would have no additional encroachments on 100-year floodplains.

The lost floodwater storage volume for each potential floodplain encroachment will be calculated during a later design phase, and the need and volume for compensatory storage will be determined.

TABLE 4-15
Floodplain Encroachments

Floodplain Encroachment	Alternative ^a	Transverse or Longitudinal?	Estimated Volume of Fill m³ (yd³)
Troublesome Creek	C	Transverse	37,000 (48,394)
Camp Creek	C	Transverse	16,400 (21,450)
Grindstone Creek	C	Transverse	71,100 (92,995)
Carter Creek	C	Transverse	33,600 (43,947)
Illinois River	C	Transverse	46,600 (60,950)
Clear Creek	A	Transverse	206,800 (270,484)
Prairie Creek	A	Transverse	22,500 (29,429)
Indian Creek (site 2)	A	Transverse	26,900 (35,184)
Branch of Mud Creek	A	Transverse	212,500 (277,939)

TABLE 4-15
Floodplain Encroachments

Floodplain Encroachment	Alternative ^a	Transverse or Longitudinal?	Estimated Volume of Fill m ³ (yd ³)
Illinois River	E	Longitudinal	1,374,900 (1,798,300)
Indian Creek (site 1)	E	Transverse	984,600 (1,287,808)
Coon Run Creek	E	Transverse	72,800 (95,219)
Willow Creek	E	Transverse	^b
Mauvaise Terre Creek	C	Transverse	174,000 (227,583)

^a C = Common Segments A = Alternative A E = Alternative E

^b Crossing occurs within the Illinois River 100-year floodplain; fill included in Illinois River calculation

4.3.4.1 Common Segment

Six designated 100-year floodplains would be crossed by common segments of U.S. 67 expansion (Table 4-15). Four of these floodplains are within the La Moine River drainage basin (Troublesome Creek, Camp Creek, Grindstone Creek, and Carter Creek), one is within the Central Illinois River drainage basin (Illinois River), and one is within the Lower Illinois River drainage basin (Mauvaise Terre Creek). With the exception of the Illinois River, floodplains generally consist of a narrow band adjacent to the waterways. All floodplain crossings along common segments would be transverse.

Crossings for Troublesome Creek, Camp Creek, Carter Creek, and Mauvaise Terre Creek would occur nearby to existing U.S. 67 structures (bridges/culverts). New structures that cross floodplains would be designed with an effective waterway opening equal to or greater than those of the existing structures, and backwater surface elevations are not expected to increase. As a result, there will be no significant adverse impacts on natural and beneficial floodplain values; there will be no significant change in flood risk; and there will be no significant increase in potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that these encroachments are not significant.

The Grindstone Creek crossing along the Industry bypass would occur at location where there are no existing structures (bridges/culverts). However, new drainage structures will result in an insignificant change in the waterbodies capacity to carry flood water, causing a minimal increase in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values; they will not result in any significant change in flood risks or damage; and they do not have significant potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

The Illinois River has a great expanse of floodplain within the project area. A portion of this floodplain, extending from approximately Drainage Road (south of Beardstown) north across the Illinois River, would be crossed by a common segment of U.S. 67 expansion. Much of this area is protected from a 100-year flood event by a levee system constructed and maintained by the USACOE. This crossing would generally be transverse and would

involve replacement of the existing bridge. This bridge replacement could create a significant increase in potential for interruption or termination of emergency service or emergency evacuation routes and, therefore, represents a significant encroachment.

4.3.4.2 Alternative A

Four designated 100-year floodplains would be crossed by Alternative A (Table 4-15). All of these floodplains are located in the Lower Illinois River drainage basin. The floodplains generally consist of a narrow band adjacent to the waterways and all crossings would be transverse. Each of the floodplain crossings (Clear Creek, Prairie Creek, Indian Creek, and a Tributary to Mud Creek) would occur at locations where there are no existing structures (bridges/culverts). However, new drainage structures will result in an insignificant change in the waterbodies capacity to carry flood water, causing a minimal increase in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values; they will not result in any significant change in flood risks or damage; and they do not have significant potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that these encroachments are not significant.

4.3.4.3 Alternative E

Four designated 100-year floodplains would be crossed by Alternative E (Table 4-15). All of these floodplains are located in the Lower Illinois River drainage basin. All crossings, except for the Illinois River, would be transverse to a narrow band of floodplain adjacent to the waterway. Stream crossings for Indian Creek, Coon Run, and Willow Creek would occur near existing U.S. 67 structures (bridges/culverts). New structures that cross floodplains would be designed with an effective waterway opening equal to or greater than those of the existing structures, and backwater surface elevations are not expected to increase. As a result, there will be no significant adverse impacts on natural and beneficial floodplain values; there will be no significant change in flood risk; and there will be no significant increase in potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that these encroachments are not significant.

Alternative E would also involve a longitudinal encroachment of the Illinois River 100-year floodplain. This 21-kilometer (13-mile) long longitudinal encroachment extends from near the IL 104 intersection with U.S. 67 north to Drainage Road (south of Beardstown). The area between Indian Creek and Drainage Road is protected from the 100-year flood by a levee system built and maintained by the USACOE.

Alternative E would be constructed at least 0.9 meter (3 feet) above the 50-year flood condition. In levee protected areas, the proposed roadway surface would be constructed 0.9 meter (3 feet) above the 100-year flood condition. Due to the raising of the profile and shifts in alignments, a new system of roadway ditches would be required. Existing culverts would be modified or extended, and new end sections or headwalls would be installed to satisfy the drainage and roadway safety requirements.

New structures that cross floodplains would be designed with an effective waterway opening equal to or greater than those of the existing structures, and backwater surface elevations are not expected to increase. As a result, there will be no significant adverse

impacts on natural and beneficial floodplain values; there will be no significant change in flood risk; and there will be no significant increase in potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

4.3.5 Biological Resources

4.3.5.1 Plant Communities and Habitat

Alternative A from Jacksonville to Macomb (Common + Alternative A alignments) would convert 821 hectares (2,028 acres) to roadway use (Table 4-16). Of the total, 662 hectares (1,635 acres) would be converted from agricultural lands to roadway use (accounting for 81 percent of total lands converted). Other cover types that would be affected include mesic forest (87 hectares or 214 acres), forbland and non-native grassland (15 hectares or 36 acres), riverine areas (11 hectares or 26 acres), and floodplain forests (8 hectares or 20 acres).

Alternative E from Jacksonville to Macomb (Common + Alternative E alignments) would convert 780 hectares (1,929 acres) to roadway use (Table 4-16). Of the total, 587 hectares (1,450 acres) would be converted from agricultural lands to roadway use (accounting for 75 percent of total lands converted). Other cover types that would be affected include mesic forest (101 hectares or 249 acres), forbland and non-native grassland (20 hectares or 50 acres), riverine areas (12 hectares or 29 acres), and floodplain forests (6 hectares or 15 acres).

TABLE 4-16
Cover Type Impacts, by Alternative

Vegetation Cover Type *	Common Alignment	Alternative A	Alternative E
Agricultural land	376 ha (929 ac)	286 ha (706 ac)	211 ha (521 ac)
Mesic forest	75 ha (185 ac)	12 ha (29 ac)	26 ha (64 ac)
Urban/ Developed land	17 ha (41 ac)	3 ha (8 ac)	19 ha (47 ac)
Forbland / non-native grassland	9 ha (22 ac)	6 ha (14 ac)	11 ha (28 ac)
Riverine	10 ha (24 ac)	1 ha (2 ac)	2 ha (5 ac)
Floodplain forest (wet-mesic)	6 ha (15 ac)	2 ha (5 ac)	0 ha (0 ac)
Fencerow	2 ha (5 ac)	1 ha (3 ac)	2 ha (5 ac)
Pine plantation	1 ha (3 ac)	0 ha (0 ac)	2 ha (5 ac)
Shrubland (not wetland)	2 ha (5 ac)	1 ha (2 ac)	0 ha (0 ac)
Emergent wetland	7 ha (17 ac)	1 ha (3 ac)	0 ha (0 ac)
Pond	1 ha (3 ac)	0 ha (0 ac)	0 ha (0 ac)
Sand Pond	0 ha (0 ac)	0 ha (1 ac)	1 ha (2 ac)
Loess hill prairie	0 ha (1 ac)	1 ha (3 ac)	0 ha (0 ac)
Sand prairie	0 ha (0 ac)	1 ha (2 ac)	0 ha (0 ac)
Total	506 ha (1,250 ac)	315 ha (778 ac)	274 ha (677 ac)

* Cover type areas rounded to the nearest whole number

Common Segments. Plant community types that would be impacted in common segments of the proposed improvements to U.S. 67 include remnants of floodplain forests, mesic forests, and marsh. Impacts to floodplain forests and marsh were previously discussed in Section 4.3.3, *Wetlands*. Impacts to notable mesic forest communities area summarized in Table 4-17 and shown on Figure 4-2.

TABLE 4-17
Potential Impacts to Mesic Upland Forest

Site Location	Impacts	Outstanding Characteristics	Figure 4-2 Exhibit*
Mauvaise Terre Creek	0.02 ha (0.05 ac)	<ul style="list-style-type: none"> FQI of 30.7 Large remnant of mesic upland forest 	Blue 2 and Orange 2
Road Side Picnic Area	0.22 ha (0.54 ac)	<ul style="list-style-type: none"> FQI of 32.1 Large remnant of mesic upland forest 	Green 12
East Fork of Crane Creek	1.1 ha (2.7 ac.)	<ul style="list-style-type: none"> Large remnant of mesic upland forest along and above East Fork of Crane Creek floodplain 	Green 13
West Branch of Sugar Creek	<0.01 ha (0.01 ac)	<ul style="list-style-type: none"> Mesic upland forest along west Branch of Sugar Creek 	Green 19

* Location shown as Figure 4-2 on designated Exhibit #

Alternative A. Natural plant communities potentially impacted along Alternative A include loess hill prairie near Arenzville, and dry sand prairie and sand pond in the Sanitary Landfill Area. Impacts to sand ponds were previously discussed in Section 4.3.3, *Wetlands*. Table 4-18 summarizes potential impacts to loess hill prairie and sand prairie communities along Alternative A. Impacts are shown on Figure 4-2.

TABLE 4-18
Potential Impacts to Natural Plant Communities along Alternative A

Plant Community Types/ Site Name	Impacts	Outstanding Characteristics	Figure 4-2 Exhibit *
Mud Creek Loess Hill Prairie	0.03 ha (0.07 ac)	<ul style="list-style-type: none"> INAI Category II site FQI of 36.1 Occurrence of state threatened <i>Cirsium hillii</i> and <i>Agalinis skinneriana</i>, and <i>Hesperia ottoe</i>. Potential habitat for <i>Speyeria idalia</i>. 	Blue 6
Dry Sand Prairie	0.63 ha (1.56 ac)	<ul style="list-style-type: none"> FQI of 19.2 Occurrence of state threatened <i>Cyperus grayioides</i> Potential breeding site for <i>Speyeria idalia</i>. 	Blue 8

* Location shown as Figure 4-2 on designated Exhibit #

Alternative E. Natural plant communities potentially impacted along Alternative E include a sand pond community south of Indian Creek (Figure 4-2: Orange 8). The site supports the state threatened Illinois chorus frog and Hall's bulrush, and is discussed in Section 4.3.3, *Wetlands*.

4.3.5.2 Wildlife Impacts

Potential impacts to wildlife species may consist of loss of habitat, habitat fragmentation, disruption of animal movement patterns, and mortality associated with vehicle/wildlife collisions. Wildlife impacts would mostly occur to those relatively common species that are not listed as threatened or endangered. Species include whitetail deer, raccoon, Virginia opossum, gray squirrel, skunk, several waterfowl species, and a variety of songbirds.

Potential impacts to these wildlife species and their habitat are expected to be greater for Alternative A than for Alternative E, since Alternative E generally follows the existing U.S. 67 alignment while Alternative A would involve a completely new corridor through open country as well as maintaining the existing U.S. 67 roadway.

Habitat Loss. Loss of potential habitat can be measured through estimates of cover type losses that support wildlife. As discussed above and summarized in Table 4-16, new right-of-way areas will result in the loss or conversion of several cover types that support various wildlife species. Mauvaise Terre Creek, Arenzville Bluffs, Sanitary Landfill, Beardstown Marsh, the Illinois River and associated floodplain, and Schuy-Rush Lake are the most notable wildlife habitat areas within the proposed U.S. 67 right-of-way areas.

Four of these notable wildlife areas (Mauvaise Terre Creek, Beardstown Marsh, Illinois River, and Schuy-Rush Lake) occur along common segments of the proposed alignments. The Beardstown Marsh supports many amphibian and reptile species, as well as a large number and diversity of birds. Waterfowl are abundant, particularly during migration, as are several other wading and/or shore birds. The extensive floodplain forests along the Illinois River also provide habitat for a variety of species and are important corridors during periods of avian migration. In winter months, forested areas along the river may provide roost sites for species such as the bald eagle. Forested habitats along Mauvaise Terre Creek and Schuy-Rush Lake also provide wildlife habitat for various species of birds. The Mauvaise Terre Creek floodplain supports a number of amphibian and reptile species. Impacts to these notable wildlife areas are summarized above in Section 4.3.3, *Wetlands* and shown on Figure 4-2.

Two notable wildlife areas, Arenzville Bluffs and Sanitary Landfill, occur along the Alternative A alignment. A number of terrestrial invertebrate species (butterflies) were observed in the loess hill prairie and sand prairie habitats of the Arenzville Bluffs and Sanitary Landfill areas. The sand prairie and ponds at the Sanitary Landfill also support a diversity of amphibian and reptile species. Impacts to these notable wildlife areas are summarized above in Table 4-18 and shown on Figure 4-2.

Habitat Fragmentation/Barriers to Movement. Wildlife species, particularly birds, are known to be sensitive to actions that break habitat into small, isolated blocks, a process known as fragmentation. Some avian species require large continuous forest cover as a component of their habitat. These area-sensitive species avoid “edges” and do not nest successfully near edge areas. Small plot sizes of forested areas increase the edge length, which in turn can lead

to increased nest predation and the presence of “edge” species such as the brown-headed cowbird. Brown-headed cowbirds are nest parasites, laying eggs in the nests of other species, resulting in lower nest success of the host species. Forest interior birds are particularly susceptible to nest parasitism, and the presence of cowbirds is considered a potentially serious threat. In Illinois, forest and other habitat fragmentation is a significant factor in the decline of several bird species (INHS 1993). Highway construction may compromise foraging habitat and impede wildlife movement through forested corridors. New woodland edges created by the highway may experience tree loss due to drying effects of sun, wind, and exposure to pollutants. Some woodland edges may become unsuitable for wildlife because of increased noise and highway activity.

Woodland communities in the primarily agricultural project area vary among counties, but mostly consist of small, isolated woodlots. Large contiguous tracts of forested land are few. In terms of habitat fragmentation, the project area has already been significantly dissected. The most contiguous forested areas are present in the Arenzville Bluffs area, Mauvaise Terre Creek, and steep slopes on the north side of the Illinois River.

Some habitat fragmentation would occur in common segments of the proposed U.S. 67 alignment. Fragmentation in these areas would generally occur as a result of improvements to an existing corridor, rather than the result of large tracts of land being divided. Notable areas within common segments where minor habitat fragmentation would occur include:

- Mesic forests and emergent marsh adjacent to Mauvaise Terre Creek
- Floodplain forest along the banks of the Illinois River
- Mesic forest adjacent to the Roadside Picnic Area
- Floodplain forest near East Fork of Crane Creek
- Forests and emergent marsh at Schuy-Rush Lake
- Forested areas near West Branch of Sugar Creek
- Forested areas near Carter and Camp Creeks

These areas are already degraded from road and development related disturbances. Additional habitat fragmentation to forested areas would occur along the Rushville bypass near Town Branch and Horney Creek. These impacts would not occur along the existing U.S. 67 alignment.

Alternative A would bisect or remove edge areas of forested cover types near a Tributary of Mud Creek (south of Arenzville), in the Arenzville Hill Prairie area, and near the Sanitary Landfill. Four forested areas greater than 8 hectares (20 acres) would be affected. The impacts to forested areas along Alternative A occur in open country with no existing transportation corridor. Bisecting forested areas will create edges, thus potentially accelerating the detrimental effects of fragmentation, such as creating barriers to wildlife movement, encouraging nest parasitism of neotropical migratory birds, tree loss, and exposure to pollutants.

Alternative E would impact forested areas near County Line Road, Kuhlman Road, and Berger Lane. Six areas greater than 8 hectares (20 acres) would be impacted. The impacts to forested areas along Alternative E occur along the existing transportation corridor. While these impacts will have minor impacts to wildlife, impacts are minimized as they occur in existing impacted areas.

Wildlife Mortality. Impacts to wildlife populations due to vehicle collisions are another potential consequence of project development. The majority of vehicle collisions in the

project area would impact common wildlife species such as whitetail deer, raccoon, Virginia opossum, gray squirrel, skunk, and potentially several more common avian species. However, it is not known whether the rates of vehicle/wildlife crashes will increase beyond current levels. Recent studies by the U.S. Environmental Protection Agency (USEPA) and the Highway Safety Information System (HSIS) report that the overall rate of animal collisions has steadily increased over a 7-year period. The HSIS study, which included data from Illinois and four other states, also found the rate of animal crashes, expressed as the number of accidents per million vehicle kilometers, was greatest on 2-lane rural roads, followed by multi-lane rural and urban road types. The study reported collision rates for rural roads ranged from 0.07 to 1.16 crashes per kilometer per year (Hughes and Saremi 1995).

Assuming that the rate of animal crashes is greatest on 2-lane rural roads, upgrading U.S. 67 from a 2-lane to multi-lane road type could result in lowering overall rates of animal collisions, particularly for Alternative E, which will primarily follow the existing corridor. However, selection of Alternative A would likely increase the overall rates of animal collisions. Not only would there be a new corridor through open country, but the existing U.S. 67 roadway would still be in use.

4.3.5.3 Threatened and Endangered Species

The Illinois Department of Transportation (IDOT) prepared a Biological Assessment/Detailed Action Report for the U.S. 67 project in accordance with Section 7 of the U.S. Endangered Species Act and Section 11 of the Illinois Endangered Species Protection Act (520 ILCS 10/1 *et seq*) to the U.S. Fish and Wildlife Service (USFWS) and the Illinois Department of Natural Resources (IDNR). Both the Illinois Department of Natural Resources (IDNR) and the U.S. Fish and Wildlife Service (USFWS) reviewed the Biological Assessment/Detailed Action Report. The USFWS offered no additional comments pertaining to threatened and endangered species based on their review. The IDNR offered several comments concerning impact to special habitat (i.e. INAI sites). Among these included further efforts by the IDOT to avoid direct impact. If such avoidance is not possible, the IDNR has requested compensation in the form of funding special management techniques that would enhance the habitat at a site near the project. Based on the information in the Biological Assessment and IDOT's commitment (correspondence dated April 1, 2002) to explore special management techniques, IDNR has closed consultation under the Illinois Endangered Species Act (see Appendix L).

The findings of the Biological Assessment/Detailed Action Report regarding impacts to threatened and endangered species are summarized below.

- **Federal Listed Species Impacts.** The federal and Illinois threatened decurrent false aster would **not** be directly **affected** by the proposed **project**. **However, the decurrent false aster does have a tendency to appear at different locations on an annual basis and could appear at a shifted location at a later date. Before construction begins in the Beardstown Marsh area (Figure 4-2: Green 11) the project area will be surveyed for the species.**
- **State Listed Species Impacts.** Development of Alternative A from Jacksonville to Macomb (Common + Alternative A alignments) would impact **three** Illinois threatened or endangered species: **one** plant species, **one** terrestrial invertebrate species, and one

amphibian species. Development of Alternative E from Jacksonville to Macomb (Common + Alternative E alignments) would impact **two** Illinois threatened or endangered species: **one** plant species, and one amphibian species.

Under the Illinois Endangered Species Act, an Incidental Take Permit is required when a state action would result in the death or injury of any Illinois-listed animal species. An Incidental Take will be authorized by the IDNR only after submittal of a Conservation Plan. A Conservation Plan will be prepared to address a number of aspects: the impact of the proposed taking; measures to minimize and mitigate the impact; funding that will be available to undertake environmental mitigation; alternative actions that would avoid potential takes; data and information that show the proposed taking will not reduce the likelihood of the survival of the species; and an agreement between the IDNR and IDOT to carry out the elements of the plan. The Conservation Plan is open to public review and comment.

The Illinois Department of Transportation has selected Alternative E as the preferred alignment. Implementation of Alternative E (Common + Alternative E alignments) would require Incidental Take provisions for two state-listed species: Patterson Bindweed and Illinois chorus frog. IDOT plans to submit an Incidental Take request during the design phase of the project. An approved Conservation Plan will be in place before construction begins on the roadway sections that contain listed species.

Common Segments. One plant species listed as federally threatened and state threatened and one state threatened amphibian species would **potentially** be impacted along common segments of U.S. 67 expansion (Table 4-19). These species impacts would occur in the vicinity of Beardstown (Figure 4-2: Green 11).

As discussed above, the federally and Illinois threatened decurrent false aster would **potentially** be impacted in the Beardstown Marsh area. The Illinois chorus frog (Illinois threatened) was observed just south of the Illinois River crossing and the site would be impacted.

TABLE 4-19
Threatened and Endangered Species Potentially Impacted Along Common Segments

Species	General Location	Status
Decurrent false aster (<i>Boltonia decurrens</i>)	Beardstown Marsh Area	FT, ST
Illinois chorus frog (<i>Pseudacris streckeri illinoensis</i>)	Just South of Illinois River Crossing	ST

FT: Federal threatened ST: Illinois threatened

Alternative A. Three Illinois threatened and endangered species would potentially be impacted along Alternative A: **one** plant species, **one** terrestrial invertebrate species, and one amphibian species (Table 4-20). These potential impacts occur **in the Sanitary Landfill area** (Figure 4-2: Blue 8).

The proposed alignment west of the sanitary landfill would affect listed species at two sites. The first is an agricultural field (farmed wetland) that supports Hall’s bulrush and is a calling site for the Illinois chorus frog. The farmed wetland is 0.67 hectare (1.7 acres)

in size. Approximately 0.55 hectare or 1.4 acres of the site would be filled. The second site is a dry sand prairie remnant surrounding a pine planting. About 20 to 25 regal fritillaries were observed at the site. About 0.61 hectare (1.5 acres) along the eastern edge of the site would be affected by the project.

TABLE 4-20

Threatened and Endangered Species Potentially Impacted along Alternative A

Species	General Location	Status
Regal fritillary habitat (<i>Speyeria idalia</i>)	Arenzville Hill Prairie Area Sanitary Landfill Area	ST
Illinois chorus frog (<i>Pseudacris streckeri illinoensis</i>)	Sanitary Landfill Area	ST
Hall's bulrush (<i>Scirpus hallii</i>)	Sanitary Landfill Area	ST

ST: Illinois threatened

Alternative E. Two Illinois threatened and endangered species would potentially be impacted along Alternative E: **one** plant species and one amphibian species (Table 4-21).

A site containing a single small Patterson bindweed (Illinois endangered) plant would be impacted along Alternative E on the east side of existing U.S. 67 north of Berger Lane (Figure 4-2: Orange 10). Previously there had been a larger population at this site, but the area was cleared for housing and it appears that all of the plants except one were destroyed. The plant occurred in a mowed orchard 10 meters (30 feet) east of the edge of pavement, and would probably not persist regardless of U.S. 67 project impacts.

There are five locations along Alternative E where chorus frog habitat would be impacted. At each location, chorus frog habitat would be lost.

TABLE 4-21

Threatened and Endangered Species Potentially Impacted along Alternative E

Species	General Location	Status
Patterson bindweed (<i>Stylisma pickeringii</i>)	Along U.S. 67 near Berger Ln.	SE
Illinois chorus frog (<i>Pseudacris streckeri illinoensis</i>)	Five locations from Beardstown to Honey Point Rd.	ST

SE: Illinois endangered ST: Illinois threatened

4.3.5.4 Illinois Natural Areas

Within the common segment, one Illinois Natural Area would be impacted—the Beardstown Marsh Natural Area (Figure 4-2: Green 11). Total size of the Beardstown Marsh Natural Area is 189 hectares (468 acres); **about 1.0 hectare (2.44 acres) would be directly impacted and 0.60 hectares (1.50 acres) would be severed from the natural area; therefore, indirectly impacted. The total impact to the Beardstown Marsh Natural Area is estimated to be 1.60 hectares (3.94 acres).** These impacts would potentially result in diminished habitat suitability for several sensitive species that occur there. The nature of these impacts may

include increased noise levels during construction and operation of the proposed road improvements.

Alternative A (from Jacksonville to Macomb) would impact one Illinois Natural Area—the Mud Creek Loess Hill Prairie Natural Area (Figure 4-2: Blue 6). Total size of the Mud Creek Natural Area is 9.9 hectares (24.5 acres); about 0.03 hectare (0.7 acre) would be directly impacted. Exact boundaries of the Mud Creek Natural Area are being surveyed presently by the Natural Heritage biologist. The entire loess hill prairie site is considered an important breeding and nectaring site for the ottoe skipper. However, the site is degrading due to invasive plant species and woody encroachment, and the prairie's value to the ottoe skipper will be eliminated if no active management is implemented.

The IDNR commented on the natural area impacts as part of their review of the Biological Assessment/ Detailed Action Report. The IDNR indicated avoidance would be favored, but if avoidance is not possible, the IDNR requested funding for special management techniques to enhance nearby sites.

4.3.5.5 Illinois Nature Preserves

There are no direct impacts to any Illinois Nature Preserves by either of the alternatives.

4.3.5.6 National Wildlife Refuges and Fish and Wildlife Areas

There are no direct impacts to any National Wildlife Refuges or Fish and Wildlife Areas by either of the alternatives.

4.4 Section 4(f)

Section 4(f) of the Transportation Act of 1966 (49 USC 303) states that federal funds may not be approved for projects that use land from a publicly-owned park, recreation area, wildlife and waterfowl refuge, or any significant historic site unless it is determined that no feasible and prudent alternative exists. The law also points out that all possible planning to minimize harm to 4(f) properties must occur.

During the corridor planning process Alternatives A and E were designed to avoid all jurisdictional 4(f) resources within the study area. Among these are Chapin Park, Schuy-Rush Park, and a historic windmill in Industry. In each case, the proposed roadway would be sufficiently removed from the resources that no direct impact would occur.

Right-of-way requirements near Schuy-Rush Park and Schuy-Rush Lake prompted a critical examination of the applicability of Section 4(f) regulation (Appendix E shows several maps of Schuy-Rush Park). In the mid-1960s, the City of Rushville purchased lands (101 hectares, or 250 acres) for the purpose of using some to impound water for the future use of the city. Surveys and studies were completed to determine the shoreline of the proposed lake (Schuy-Rush Lake) impounding the water, and to determine areas of land that would not be covered by the impoundment. The city dedicated and set apart for use as playground and recreational centers “all land that was not dedicated or devoted to land to be covered by the impounded water of the proposed lake.” The city passed Ordinance No. 410, “Ordinance setting apart certain city lands as playground and recreational centers” on February 6, 1967. Since the passage of the ordinance, the city has developed the impoundment and recreational facilities on the westernmost part of the

subject property. The impoundment is used for small boating and fishing. Recreational facilities including a boat launch, picnicking area, and campground have been developed on roughly 8 hectares (20 acres) about 1,220 meters (4,000 feet) west of U.S. 67. The remaining properties are undeveloped, and the city has indicated no further plan for expanded recreational uses. Generally, casual or dispersed recreational uses do not occur on the remaining undeveloped properties. In correspondence dated December 16, 1999 (Appendix C), the FHWA determined that the proposed improvements to U.S. 67 would not be located in the section of land designated as the park; therefore, there would be no use of Schuy-Rush Park, a 4(f) resource.

Indirect or constructive use impacts were also considered. Constructive use impacts are indirect or proximate impacts that could impair or diminish the quality of the protected resource or activities associated with that resource. Chapin Park, Schuy-Rush Park, and the windmill are resources that are near the proposed improvement and, therefore, constructive use impacts were considered. In each case, the properties or activities associated with the properties are substantially removed from the proposed improvements to avoid any adverse effect.

4.5 Air Quality

4.5.1 Microscale Analysis

In accordance with the provisions of an *“Agreement on Microscale Air Quality Assessments for IDOT Sponsored Transportation Projects; Illinois Department of Transportation and Illinois Environmental Protection Agency,”* this project is exempted from a project-level carbon monoxide air quality analysis because it is a low-volume roadway with a forecasted ADT volume of 16,000 or less vehicles at the end of the first year of project operation.

4.5.2 Conformity

No portion of this project is within a designated nonattainment area for any of the pollutants for which USEPA has established standards. Accordingly, a conformity determination under 40 CFR Part 93 (“Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 USC or the Federal Transit Act”) is not required.

4.6 Noise

4.6.1 Definition of Noise Impact

Traffic noise levels were calculated using the FHWA Traffic Noise Model (TNM) Version 1.0b. It was used to calculate traffic-generated noise levels in terms of L_{eq} (h), the hourly energy equivalent sound level, which is based on an “A-weighted” decibel unit (dBA).

Noise is composed of different frequencies, each of which is perceived differently by the human ear. Human hearing is not sensitive to low and very high frequencies. To compensate for low and high-end frequency insensitivity and thereby render noise level readings more meaningful, an “A” weighted scale is used to approximate the response of the human ear. The dBA unit measures perceptible sound energy and factors out the extreme high and low frequencies.

L_{eq} is defined as the equivalent steady-state sound level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same period. $L_{eq}(h)$ is the hourly value of L_{eq} .

The TNM program predicts noise levels using roadway geometry, traffic volume mix and speed, and other characteristics such as topographic data, existing and proposed ground elevations, and proposed roadway grades. The program processes the three-dimensional, spatial relationship between the road and receivers using a grid system and models the resulting traffic noise level that would exist at each receiver.

4.6.2 Regulations

The FHWA policies and procedures, as promulgated in the U.S. Code of Federal Regulations, 23 CFR, Part 772, served as the procedural guidelines in the analysis. Incorporated into the regulations are Noise Abatement Criteria (NAC), which are based on the type of land use and activities performed at the respective sites. At residences and schools, for example, noise guidelines establish a level of 67 dBA as the noise threshold for considering noise abatement measures. Consideration of noise abatement measures must be examined and evaluated if an equivalent steady state level of 67 dBA for an hourly period is approached or exceeded. Traffic noise impacts also occur if there are substantial increases in noise over existing conditions, independent of the NAC.

According to 23 CFR 772, traffic noise impacts occur when predicted traffic noise levels approach or exceed FHWA NAC or when predicted noise levels substantially exceed existing noise levels. In Illinois, traffic noise impacts are defined to occur under any of the following circumstances:

- Design-year traffic levels are within 1 dBA or exceed the NAC.
- Design-year traffic noise levels are greater than 14 dBA above existing traffic-generated noise levels.

4.6.3 Traffic-Generated Noise Levels

Eight receptors (individual properties) were selected as representing the surrounding area. The locations of these receptors are shown in **Figures 2-1, 2-2, and 2-3** and are detailed in Table 4-22. These receptors represent farmhouses and single-family residences. One school and one church were also selected as receptors. The eight representative noise-sensitive receptor locations have traffic noise levels ranging from about 44 to 67 dBA. Background noise levels in rural areas near Concord and Arenzville (represented by R4 and R5) are low, while noise-sensitive locations near existing U.S. 67 are exposed to higher traffic noise levels. Currently, the only noise sensitive receptor at which traffic noise levels approach or exceed the FHWA NAC is Receptor 1. This is because of the proximity of the house to U.S. 67. Existing noise levels at all other identified noise-sensitive receptors are well below the NAC.

TABLE 4-22

Predicted Peak-hour Noise Levels (L_{eq}) for Representative Receptors (Exterior Noise Level in dBA)

Receptor	Type	NAC	Existing	No-Build (Year 2030)	Build Alternatives (Year 2030)	
					Alternative E	Alternative A
1	Residence	67	67	70	56	56
2	Residence	67	58	61	52	59
3	Residence	67	58	63	59	61
4	Residence	67	45 *	47 *	47 *	60
5	School	67	44	46	46	48
6	Residence	67	55	57	54	54
7	Residence	67	52	54	50	50
8	Church	67	56	58	56	56

* In the absence of a major roadway, noise levels at R4 are estimated based on background noise levels in similar settings.

Shaded cells indicate receptor locations at which traffic noise levels approach or exceed the FHWA NAC.

Under the No-Build Alternative, noise levels would range from 46 to 70 dBA. Receptor 1 would remain the only location where peak-hour traffic noise levels would exceed the NAC. In 2030, under both build alternatives, all noise-sensitive receptors would be less than the NAC of 67 dBA. Traffic-generated noise levels under Alternative E are predicted to be at least 8 dBA below the NAC for each receptor location. Under Alternative A, the highest peak-hour traffic noise level would be within 6 dBA of the NAC.

Since the distance from the proposed U.S. 67 to Receptor 1 will increase, traffic noise levels at this site and homes represented by it are expected to decrease substantially under both build alternatives. Under Alternative A, noise-sensitive areas within Concord closest to the proposed U.S. 67 (represented by Receptor 4) may experience a substantial traffic noise increase of 15 dBA; therefore, noise impacts would occur. However, traffic noise levels at this site would remain well below the 67-dBA criterion.

4.6.4 Consideration of Abatement Measures

Abatement measures were considered for the residential area represented by Receptor 4, where traffic-generated noise impacts were identified for Alternative A.

Implementation of traffic management measures aimed at reducing noise levels, such as a ban on heavy trucks, was determined to be impractical since U.S. 67 is designated as a Class II truck route. Reducing operating speeds by lowering the legal speed limits would not achieve a significant reduction in noise levels in the project area. Vehicle speeds on U.S. 67 would be 88 km/hr (55 mph). Reducing the speed limit to 72 km/hr (45 mph) would reduce traffic noise levels only 2 dBA. The adverse effects of a lower speed limit would outweigh the minimal reduction in traffic noise levels.

Development of a buffer area through the acquisition of additional right-of-way or easement procurement is not possible at Receptor 4 because of the proximity of the residences to the proposed roadway. The distance of the residence to U.S. 67 (20 meters, or 65 feet) from the proposed right-of-way precludes the potential for a buffer.

Dense woods or landscaping provide a visually pleasant noise screen and can provide up to 5 dBA attenuation of each 30 meters (100 feet) of width, provided that it is 5.5 to 6 meters (18 to 20 feet) high. However, the additional right-of-way costs often prohibit the use of wooded noise screens. Further, the distance of the residences to the proposed right-of-way would be less than 20 meters (65 feet); therefore, there is insufficient land to provide such a buffer. A single row of trees gives little noise attenuation, but does provide psychological reduction of noise.

Finally, shifting the alignment is not feasible. The BNSF railroad tracks prohibit shifting the alignment farther east, and shifting the alignment west would cause even greater impact to residences and to the community of Concord.

Construction of a barrier was the only viable option for reducing traffic noise levels at Receptor 4. In Illinois, noise walls are considered effective when an 8-dBA reduction in sound can be obtained using barriers and where the total cost of those barriers does not exceed \$24,000 per benefiting residence. As there are only two homes in the first tier beyond the proposed roadway, installing a barrier would exceed the cost criteria.

Therefore, noise abatement measures are not recommended for this project. Traffic noise abatement is not likely to be incorporated in the proposed project or contract plans.

4.7 Cultural Resources

As indicated in Section 2.6, *Cultural Resources*, surveys conducted within the corridor area recorded numerous prehistoric and historic sites. Of the 167 architectural properties observed within the project corridor, four buildings were found that could be eligible for inclusion on the National Register. These structures, which may be subject to Section 4(f) of the Department of Transportation Act of 1966, include one house, a barn, and two one-room schools. None of these properties would be directly affected by the selected alignment. Once detailed construction plans are prepared for highway sections near these properties, the Illinois State Historic Preservation Officer (SHPO) will have the opportunity to review these plans to determine whether the project will have any effects on these structures.

Of the 290 archaeological sites found, 127 will require subsurface evaluation should they be impacted by the final highway alignment. All mounds and cemeteries will be avoided by the selected alignment. All of the sites that merit further evaluation have potential National Register significance due to the data that they may yield concerning prehistoric life-ways in this region of Illinois (Criterion D). No archaeological sites historically associated with federally recognized Native American tribes were found within the project corridor. No archaeological sites that merit preservation in place will be impacted by the selected alignment. The results of subsurface investigations of archaeological sites, and any others found subsequently, will be evaluated for a determination of eligibility (DOE) for the National Register of Historic Places. A formal DOE will be submitted to the Illinois SHPO for concurrence. Should any of these properties be determined eligible, the Advisory Council on Historic Preservation (ACHP) will be notified of the pending adverse effect. If

the ACHP chooses to participate in project coordination, a three-party Memorandum of Agreement (MOA), incorporating a data recovery plan, will be developed among the FHWA, the Illinois SHPO, and the ACHP. Should the ACHP decline participation, ratification of the MOA will be limited to the two other parties.

4.8 Special Waste

4.8.1 Hazardous Waste

Based on the USEPA listing of Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) sites (**April 24, 2002** [USEPA 2002]), no CERCLIS sites will be involved with or affected by either project alternative.

4.8.2 Non-Hazardous Waste

Illinois State Geological Survey (ISGS) conducted a Preliminary Environmental Site Assessment (PESA) for special waste and identified excavation stipulations at 18 sites where there were special waste concerns. Based upon evaluation of these site locations and their proximity to the proposed alternative alignments, it was determined that none of these sites would be impacted. Thirteen of the 18 sites are outside of the proposed right-of-way. The remaining five sites are in the proposed right-of-way (three along the common segment, two along Alternative E, and none along Alternative A), but the depth stipulations would not be exceeded. Detail on sites that would be acquired, but would not exceed stipulations is provided in Table 4-23.

The PESA for the subject project was completed on October 17, 1997. Standards issued by the American Society for Testing and Materials (ASTM) indicate that property audits for special waste/regulated substance contamination should only be considered valid for a period of six months. Per the BDE Manual, Chapter 27, Section 2.07, the district has reevaluated the project area.

It has been determined that it is not necessary to complete a supplement PESA for the subject project. This determination was based upon review of the existing land use throughout the proposed corridor. In addition, the EPA CERCLIS Hazardous Waste Site list (updated March 19, 2002) and the IEPA LUST Site list (updated April 19, 2002) were reviewed to determine the presence of any new sites within the project corridor. This search did not uncover any new sites or significant land use changes within the project corridor; therefore, the PESA dated October 17, 1997, is revalidated effective April 24, 2002 (Appendix G).

TABLE 4-23
Non-Hazardous Special Waste Impacts

Site and ISGS No.	Type of Contamination	Location	Comment
Bedwell Farm, 568-5a and 568-5b	VOCs	Common Segment	PESA stated no concern as long as construction does not exceed 0.9 m (3 ft) at boreholes 568-5a and 5b. This depth will not be exceeded; construction will involve fill at this location.

TABLE 4-23
Non-Hazardous Special Waste Impacts

Site and ISGS No.	Type of Contamination	Location	Comment
Amoco Pipeline, 568-8a and 568-8b	Hexane less than 8 ppm; unidentified VOCs with retention times greater than that of methane	Common Segment	PESA stated no concern as long as construction does not exceed 1.8 m (6 ft) within 15 m (50 ft) at boring 568-8a; and 2.7 m (9 ft) within 15 m (50 ft) of boring 568-8b. These depths will not be exceeded by construction.
Unnamed tank battery, 568-18a and 18b	Unidentified VOC with a retention time greater than that of methane at 18a Total VOCs were detected at a concentration of 80 ppm at 18b	Common Segment	PESA stated no concern as long as construction does not exceed 0.3 m (15 ft) at boring 568-25a. This site will be acquired but not disturbed by construction.
Lovcamp Farm, 568-31a	Unidentified VOCs with retention times greater than that of methane	Alternative E	PESA stated no concern as long as construction does not exceed 1.8 m (6 ft) within 7.6 m (25 ft) at boring 568-31a. This depth will not be exceeded; construction will involve fill at this location.
Former gasoline station, 568-33	Unidentified VOCs with retention times greater than that of methane	Alternative E	PESA stated no concern as long as construction does not exceed 0.9 m (3 ft) at boring 568-33. This depth will not be exceeded; construction will involve fill at this location.

4.9 Visual Impacts

Visual impacts were considered from two perspectives: the view of the road as seen by persons living, working, or spending leisure time nearby, and the motorist's view from the road.

Alternative A south of the Illinois River would be located on new alignment; therefore, the visual impacts on the landscape would tend to be greater than improvements adjacent to existing roadways. Part of the alignment parallels the BNSF railroad tracks, while another part crosses farmlands or wooded areas. North of the river, the alignment follows U.S. 67, except where it bypasses the communities of Rushville and Industry. Alternative A would introduce a new roadway through farmland and wooded areas. The hilly, forested area of the bluffs would provide scenic variety for motorists. The remainder of the corridor views would be agricultural lands typical of the area. The visual impacts north of the Illinois River would be the same as for Alternative E.

On Alternative E, because the proposed alignment generally follows the existing alignment (except as it bypasses Beardstown, Rushville, and Industry), the proposed improvements would have minimal visual impacts on the project-area landscape. Although there is a difference between a 4-lane facility and a 2-lane facility, the presence of an existing 2-lane road reduces the visual effects resulting from its expansion to four lanes. The addition of two lanes and a median will increase the scale of the highway, but the generally flat, open

terrain adjacent to the highway would diminish the visual impact of the proposed improvements. The motorist's view from the road throughout most of the corridor would be predominantly of the agricultural lands typical of the area. Just north of the Illinois River are bluffs that are heavily wooded and provide scenic variety. Various stream crossings are also wooded and offer scenic relief and variety.

4.10 Energy

Construction of the proposed U.S. 67 improvement would require indirect consumption of energy for processing materials, construction activities, and maintenance of the lanes to be added within the project limits. Energy consumption by vehicles in the area may increase during construction due to possible traffic delays.

Construction of the proposed improvement will result in more efficient traffic operations along the route and thereby reduce vehicle stopping and slowing conditions. Additional benefits would be realized from increased capacity and smoother riding surfaces. This would result in less direct and indirect vehicular operational energy consumption for the build alternatives than for the No-Build Alternative. Thus, in the long-term, post-construction operational energy requirements should offset construction and maintenance energy requirements and result in net savings in energy usage.

4.11 Construction Impacts

Construction impacts are generally of short duration and end shortly after project completion. They typically include affects upon the natural environment, air quality, noise levels, land use access, traffic, and solid waste. The expected short-term construction impacts associated with the build alternative are identified below.

4.11.1 Air Quality

The primary potential construction impact on air quality would be fugitive dust (particulates) resulting from soil exposed to wind and traffic. The quantity of fugitive dust from the construction activities would vary depending on the construction location, the extent of activity, silt content, soil moisture, and wind speed. Construction activities would generate fugitive dust that may be a nuisance in nearby areas. However, the contribution of the proposed project to the total suspended particulates in the surrounding area would be small and of short duration.

During construction, blowing dust from areas cleared or excavated for access or construction purposed can be minimized in several ways. Water can be applied to unpaved road surfaces. The effectiveness of watering for fugitive dust control depends on the frequency of application. It is estimated that watering an entire area twice daily would reduce dust emissions by as much as 50 percent. These measures would be employed as needed during construction of the proposed improvements to control fugitive dust. Construction vehicles would also emit carbon monoxide, hydrocarbons, and nitrogen oxides. Ambient concentrations, however, would not be increased significantly by operation of construction vehicles and machinery.

4.11.2 Construction Noise

Trucks and machinery used for construction produce noise that may affect some land uses and activities during the construction period. Individuals inhabiting the homes along the alignment will at some time experience perceptible construction noise from implementation of the project. IDOT's *Standard Specifications for Road and Bridge Construction as Article 107.35, adopted January 1, 1997*, contains mitigation measures to minimize or eliminate the effects of construction noise on receptors.

All construction equipment will be required to have mufflers constructed in accordance with the equipment manufacturer's specifications, or a system of equivalent noise-reducing capacity. Mufflers and exhaust systems must be in good operating condition and free from leaks and holes. Daily operating hours for construction will coincide with the construction schedule needs of IDOT.

4.11.3 Dust Control

The contractor shall be responsible for controlling the dust and air-borne dirt generated by construction activities. When circumstances warrant, a specific dust control plan shall be developed. The contractor and the IDOT shall meet to review the nature and extent of dust generating activities and cooperatively develop specific types of control techniques appropriate to that specific situation. Sample techniques that may warrant consideration include minimizing track out of soil onto nearby publicly traveled roads; reducing vehicle speed on unpaved surfaces; covering haul vehicles; and applying chemical dust suppressants or water to exposed surfaces, particularly to surfaces on which construction vehicles travel. Dust control measures as indicated in the Dust Control Plan, or as directed by the engineer, shall be readily available for use on the project site.

4.11.4 Temporary Access/Traffic

Access to all properties will be maintained by staged construction, temporary access roads, or other appropriate means. Traffic may be stopped for short periods, temporarily inconveniencing motorists while construction equipment is moved on or across the highway. Emergency service routes and access for emergency vehicles would be maintained.

4.11.5 Water Quality

Typical operations associated with construction of bridges, culverts, and roadway approaches involve clearing, grading, filling, and excavation. These activities all increase the erosion potential of surface soils due to the reduction in vegetative cover and increased impervious areas resulting from compaction of soil by heavy equipment. Structures encroaching on or crossing streams would require in-stream work that may cause an increase in turbidity and sedimentation, and temporarily alter downstream hydraulics and substrate conditions. Any long-term increases in suspended sediments can reduce aquatic productivity by limiting photosynthesis, lowering oxygen levels, and covering food sources and fish spawning areas. Generally, the application of reasonable mitigation measures would reduce the affects of turbidity and sedimentation upon streams and creeks to minor short-term levels.

For this project, the major short-term water quality impacts due to construction would result from erosion and in-stream work associated with bridge or culvert construction. Because of

construction in and around the drainageways, some sedimentation would occur. Proper erosion control methods, according to IDOTs *Joint Design/Construction Procedure Memorandum on Erosion and Sediment Control*, would be employed to minimize erosion and sedimentation. Construction related erosion impacts would be minimized by:

- Staging construction to minimize the size of exposed areas open at the same time and the length of time each area is exposed
- Regaining existing vegetation where feasible by stripping only areas where construction would occur
- Minimizing slope steepness and length; reseeding and mulching slopes every 7 days during construction, as well as at the completion of construction
- Employing temporary erosion control measures such as hay bales, silt fences, etc.

4.11.6 Solid Waste

In accordance with state and federal regulations, the contractor will dispose of grass, shrubs, trees, old pavement, miscellaneous debris, and other solid wastes generated during construction.

4.11.7 Utility Services

Construction activities will be coordinated with public utilities to avoid crashes and minimize planned interruptions and service. When service interruptions are unavoidable, every effort will be made to limit their duration.

4.12 Secondary Impacts

Secondary effects are those “caused by an action and are later in time or further removed in distance but are still reasonably foreseeable” (40 CFR 1508.8), such as construction of a new commercial center near an intersection created by a new highway facility. Secondary impacts affect the natural and manmade environment beyond the footprint or right-of-way of the project. They include the reasonably foreseeable land use changes that may occur as an indirect result of implementing the project. Secondary impacts may involve changes in the project area, such as increased traffic volume, population, employment, tax base, and land use changes that may follow implementation of the improvements for U.S. 67.

The evaluation of secondary impacts began with the establishment of the geographic area for which secondary impacts could be reasonably expected to occur. The north and south limits of the proposed action (Jacksonville on the south and Macomb on the north) were considered to be the reasonable extent of secondary impact area. The rationale for using these limits is related to two other U.S. 67 improvement projects that extend north from Macomb and south from Jacksonville. The companion projects to the north and south account for any secondary impacts beyond the north and south limits of the proposed action. Therefore, secondary impacts associated with the proposed action will only be those between the termini of Jacksonville and Macomb. The east and west limits of the secondary impact area are generally defined as 3.2 kilometers (2 miles) to the east and west of the

alternative alignments, which is the extent for which improved mobility and access may affect land use decisions.

4.12.1 Land Use Trends

The project area contains two principal cities and several small communities with a combined population under 100,000. Population growth has been slow, with population actually decreasing by 2.6 percent between 1990 and 2000. Macomb and Jacksonville are the principal economic centers in the area with Meredosia, Rushville, and Beardstown each having a sizeable economic base.

The proposed improvements to U.S. 67 are expected to maintain existing commerce and influence new growth. Realistically, the proposed roadway improvement would not produce a “boomtown” effect; that is, rapid population growth in response to quick paced economic growth. Instead, the road improvement would be expected to provide an attribute to the region that would allow the communities to compete favorably for new commerce and sustain a measured growth in new commerce. The build alternatives would support local and regional economic goals by providing reliable travel to and from the area. Over the long term, the build alternatives would assist all sectors of the economy to generate additional development and jobs.

The long-term impact of the build alternatives upon commerce and employment in the project area is estimated to be a 1.75-percent average annual growth rate (see the “Employment” subsection under “Economic Impacts”). This rate is nearly 25 percent greater than that experienced in the last 20 years, and 0.5 percent greater (annually) than the No-Build Alternative. Compared to the No-Build Alternative, the build alternatives would grow employment in the area to an estimated 10,500 jobs by 2020. This small change in the capture rate of new economic development would result in a significant economic value to the area.

New commerce would be expected to locate in communities that have available land for development and supporting infrastructure. Other factors that would influence industrial location are available labor force, education, quality-of-life factors, and financial incentives. Logically, most new industry can be expected to locate in communities with established industrial areas that have convenient vehicular access and the necessary facilities to provide water supply and wastewater disposal. The communities in the region best positioned for industrial growth are Jacksonville, Macomb, Beardstown, Rushville, and Meredosia, based on the current mix of businesses that have located in these communities. In spite of the healthy mix of existing industry, the type of industry most likely to move to this area is agribusiness operations or businesses that supply or receive products from agribusinesses. The most likely locations for these businesses are in or near the existing communities with industrial parks. The five principal cities that cater to new industry have sufficient land developed or planned that would accommodate the demand for additional industrial properties.

While several of the communities are undertaking economic development efforts, there are very few developments underway at this time. Rushville was recently selected as the location for a new state juvenile detention center. This will be located on county-owned land near the proposed bypass. Construction of this facility is scheduled to start in 2001. It is expected that when the prison is built, other development will occur in the area that supports this facility (such as hotel or motel accommodations and restaurants). In Beardstown, there have been

discussions about establishing a riverboat gambling facility on the Illinois River, west of the proposed U.S. 67 bridge crossing. No other developments have been proposed or discussed anywhere along the corridor.

Whereas jobs in the area are expected to increase over the next 20 years, population is expected to be stable or to decline slightly. Because residential location decisions are generally based on housing price, quality of schools, and other factors largely unrelated to highway improvements, the build alternatives are not expected to increase residential development in the project area. The build alternatives would generally sustain existing population levels in the four-county region and curb the current trend of population decline. The No-Build Alternative, however, would lead to a substantial population decline over current levels. This suggests that the housing stock would be sufficient for future population levels. Any growth in new housing is expected to be modest, and largely related to personal preferences that would cause individuals to move from existing housing to new housing. Similar to industrial development, new housing would be expected to locate in or near established communities. Overall, the growth in housing will be small and have a modest impact on land consumption.

The potential for secondary development (and conversion of agricultural land to other uses) is greatest for the larger communities in the corridor, such as Jacksonville and Macomb. Development is already occurring in the vicinity of the Jacksonville Bypass. Some potential for secondary development would exist in Beardstown, Rushville, and Industry. Increasing traffic volumes around these towns may lead to further commercial and retail development. In Beardstown, extensive wetlands surrounding the town would make development difficult. In Rushville, development of the prison could lead to additional agricultural conversion within proximity of that site. There is little activity in Concord, Chapin, Arenzville, or Industry to suggest that either proposed roadway alternative would induce development. Land use management at the local level can minimize the potential conversion of agricultural lands.

4.12.2 Effects of Land Use Planning/Regulation

Most of the communities in the study area do not have adopted land use plans. Most, however, can articulate a vision of the future and preferences for the location of various land uses. Despite the lack of rigorous planning, most of the communities exhibit orderly development. Other land use controls, such as zoning, are enforced in the larger communities (i.e., Jacksonville, Macomb).

The absence of land use tools would be reason for concern in a rapid growth environment. Social, environmental, and infrastructure costs typically run high in the absence of good planning. The pace of development in the study area, even with the proposed project would be expected to be manageable. Population is forecast to remain stable, causing minimal demand for new housing or expansion of community facilities.

4.12.3 Effects of Community Bypasses

Both build alternatives would bypass several communities (i.e., Alternative A would bypass Concord, Arenzville, Beardstown, Rushville, and Industry, and Alternative E would bypass

Chapin, Beardstown, Rushville, and Industry). The principal issues for these communities are potential community impacts. Generally, two things occur: one beneficial, the other not.

The benefit of a bypass would be the elimination of through-town traffic. Benefits include improved vehicular/pedestrian safety, minimizing the highway barrier effect, returning the community to a pedestrian oriented downtown, and reducing community traffic noise. All these things represent quality of life issues that occur immediately after project implementation or within a reasonable time thereafter.

The non-beneficial effects of a highway bypass are principally economic (i.e., the potential loss of revenue for highway-oriented business). The actual effect has been the subject of debate, but the general body of literature shows that businesses that are affected by a highway bypass would experience a decline in business revenue. Existing businesses dependent upon highway traffic would likely move to a bypass location. Communities with a large stock of highway-oriented business could experience a retreat of business from the downtown core. Over time, **vacant** space tends to be reoccupied with community-based business. The rate at which this occurs is related to the surroundings population's dependence upon the community for goods and services. Communities such as Rushville and Beardstown would be more resilient than Arenzville, Chapin, or Concord.

Communities that have been bypassed by new highways usually react favorably. The pedestrian atmosphere of the downtown area is generally the most often cited benefit. Some communities, however, have bad experiences. These poor reactions are typically instances in which the community has lost sense of image; passersby cannot see the community, and so are not tempted to stop for convenience items or local interest. This produces isolation that is usually detrimental for the community image and economic vitality.

4.13 Cumulative Impacts

Cumulative effects are “impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions” (40 CFR 1508.7). For example, degradation of a stream's water quality by several developments which taken individually would have minimal effects, but collectively would cause a measurable negative impact is considered a cumulative effect.

4.13.1 Land Use Development

For the U.S. 67 project, the potential of secondary development may be greatest for the larger communities in the corridor, such as Jacksonville and Macomb. Development is already occurring near the Jacksonville Bypass. Generally, development is located near I-72 but could be expected to expand along the bypass towards U.S. 67. Some potential for secondary development would exist in the communities of Beardstown, Rushville, and Industry. Increasing traffic volumes around these towns may lead to further commercial and retail development. It could also be assumed that areas where displacements occur might revert to farmland use. In Beardstown, the largest community along the project corridor, extensive wetlands surrounding the town would make development difficult or unlikely. Beardstown does not have an adopted comprehensive land use plan, but has established an enterprise zone to encourage development near its existing industrial area adjacent to the Beardstown Airport and the BNSF rail tracks. Over the past few years, the

city has entertained discussions with a developer who is interested in operating a riverboat casino on the Illinois River, west of the U.S. 67 bridge.

Land use management at the local level can minimize the potential conversion of lands. Therefore, it is essential that local municipalities establish guidelines early that meet their land use plans and regulate expansion into surrounding wetland areas.

4.13.2 Loess Hill Prairies

Loess hill prairies are a dwindling resource in the Midwest that provide refuge for a diverse assemblage of plant and animal species, including many that are federally or state listed. The Illinois Natural Areas Inventory (INAI) catalogued only 187 hectares (463 acres) of Grades A and B loess hill prairie within all of Illinois during fieldwork in 1976 and 1977 (White 1978). Approximately 13 percent of the hill prairies along the Illinois and Mississippi River valleys qualified as Illinois Natural Areas (Nyboer 1978). To date, Evers' work *The Hill Prairies of Illinois* (1955) represents one of the most comprehensive inventories of hill prairies in Illinois, regardless of floristic quality or size.

Based on analysis of historical aerial photography, Robertson et al. (1995) have estimated a loss of 63 percent of the area of hill prairies in western Illinois in the 50-year period from 1938 to 1988. Important factors closely related to loss of hill prairies are historic fire suppression, which allows encroachment of woody species, increased cattle grazing, and bluff land development.

Degradation or destruction of loess hill prairie results in habitat loss for threatened and endangered species. Listed species within the U.S. 67 project area known to occur on loess hill prairies are the ottoe skipper, the regal fritillary, the pink milkwort, Hill's thistle, and the pale false foxglove. Given the small remaining endowment of loess hill prairies in Illinois (and the Midwest), any impacts to them represent a relatively large incremental loss.

Alternative A would directly impact some acreage of loess hill prairie, while Alternative E would not. However, it is unlikely that proposed Alternative A road improvement would lead to secondary impacts to this unique resource. Factors that are currently degrading loess hill prairies within the U.S. 67 project area generally occur without respect to road improvements.

Development pressures in hilly terrain is usually residential and house-building location decisions are mostly based on factors other than quality of nearby roads. While road improvements may be an attractor for industrial or service facility siting in certain situations, the hilly terrain of the Arenzville Bluffs would generally preclude such industrial siting. Grazing pressure is a detrimental impact that already occurs on hill prairies; it is unlikely that road improvements would significantly alter grazing patterns. It is conceivable (though unlikely) that agricultural severances associated with improvements to U.S. 67 could hinder cattle access to the bluff lands thereby decreasing grazing pressure.

4.13.3 Sand Prairie and Sand Ponds

Sand prairies and sand ponds usually occur in close association with each other on top of undulating sand deposits. Much of this resource has disappeared in the twentieth century as a result of irrigated agriculture and development pressures. Though the extant area of sand

prairies and sand ponds is small in Illinois, a larger proportion of sand prairie remains extant today relative to tallgrass prairie because the sandy soils are generally undesirable for agriculture. Given the small remaining endowment of sand prairies and sand ponds in Illinois (and the Midwest), any impacts to them represent a relatively large incremental loss.

The unique edaphic conditions present in sand prairies and sand ponds provide refuge for a disproportionately large assemblage of listed species. Listed species known to occupy sand prairie and sand pond habitat within the U.S. 67 project area include the Illinois mud turtle, Illinois chorus frog, regal fritillary, Patterson's bindweed, American burnet, Vahl's fimbriatilis, small burhead, Hall's bulrush, and umbrella sedge. A loss of sand prairie or sand pond habitat also likely means a decrease in supportable populations of these listed species.

Sand prairies generally occur on well to excessively drained non-sloping areas. Such sites are often desirable for industrial siting. All sand prairies within the U.S. 67 project area occur south of Beardstown and most of these are close to existing agri-processing facilities. Industrial siting decisions are based in part on quality of adjacent roads, which relates to transport efficiency of inputs and products. Road construction along Alternative A would potentially lead to secondary impacts to nearby sand prairies and sand ponds, whereas improvements along Alternative E would not.

4.13.4 Wetlands

An estimated 90 percent of the pre-European endowment of wetlands in Illinois has been drained or filled (Suloway and Hubbell 1994). The majority of those wetlands remaining within Illinois have been degraded to some extent as a result of siltation, agricultural nutrient runoff, and infestation with invasive plant species, among other disturbances. Acreage loss of wetlands has slowed, especially in the latter half of the 20th century, as a result of federal and state policies that recognize the importance of wetlands. Despite required mitigation for wetland impacts under current federal and state policy, there continues to be a large net loss of wetland functionality.

While wetland areas have no intrinsic attractive quality as development sites (industrial or residential), they remain as some of the last remaining open spaces for development in urbanized areas. Road quality is a factor in decisions concerning industrial siting and less so in residential siting. In the context of the U.S. 67 project, it is possible that road construction could lead to secondary impacts to wetlands. This scenario is most probable where road construction, large wetland areas, and populations centers coincide, e.g., around the southern edge of Beardstown. Data analyzed do not show a notable difference in potential secondary impacts to wetlands among Alternatives A and E.

4.13.5 Upland Forest

Morgan, Cass, Schuyler, and McDonough counties have lost approximately 66, 50, 57, and 65 percent of the areal extent of forested communities, respectively, between 1820 and 1985 (Iverson 1989). This estimate includes upland forest communities and floodplain forest communities. Forest cover has increased slightly in Morgan and McDonough counties in the period from 1962 to 1985, decreased in Cass County, and remained the same in Schuyler County in this period (Iverson 1989). Forest remnants present in 1985 but not in 1962 are early successional forest and the plant assemblages are generally more indicative of disturbance.

Forested areas are attractive for residential development and in some cases for industrial siting. Forests provide an aesthetic setting often sought for residences. Forested parcels can potentially be acquired by industrial developers at less cost than cleared land. In urbanized areas, forested parcels may be the only open space left on which to build. Road quality is not strongly linked to residential site location decisions, but it is linked more strongly with industrial site development location decisions. Potential secondary impacts to upland forests may occur in areas where road improvements, existing industrial facilities, and forested parcels coincide. In the context of the U.S. 67 project area, these land-use factors coincide in the vicinity of Beardstown and Rushville. Data analyzed suggest that secondary impacts to upland forest that may result from improvements to U.S. 67 are possible though generally indistinguishable between Alternatives A and E.

4.14 Permits/ Certifications

Regulatory permits would be required regardless of the project alternative selected. These permits would include:

- Section 404 of the CWA from the USACOE
- Section 401 of the CWA Water Quality Certification from the IEPA
- Section 9 of the Rivers and Harbors Act of 1899 from the U.S. Coast Guard
- River, Lakes, and Streams Act of 1911 from IDNR - Office of Water Resources
- Notification of Demolition and Renovation permit from IEPA
- National Pollutant Discharge Elimination System (NPDES) from the IEPA
- Illinois Historic Preservation Agency (IHPA) approval under Section 106 of the National Historic Preservation Act, 1966

The USACOE issues Section 404 permits, which fulfill their regulatory function over “waters of the United States,” including wetlands. The IEPA provides water quality certification pursuant to Section 401 of the CWA. A Section 401 Water Quality Certificate is mandatory for all projects requiring a Section 404 permit.

Section 9 of the Rivers and Harbors Act of 1899 requires a U.S. Coast Guard Bridge Permit for bridges over, on, or in navigable waters, including excavating from or depositing materials necessary for bridge projects in such waters. Correspondence with the U.S. Coast Guard (June 3, 1997) has identified the jurisdiction and clearance requirements. Minimum horizontal and vertical navigational clearances will be maintained to assure that there will be no navigational impacts.

The IDNR—Office of Water Resources issues permits for work within regulatory floodways, public waters, and for the crossing of streams with more than 259 hectares (640 acres) of drainage area.

IEPA requires notification of demolition and renovation of structures. As there will be building displacements under either alternative, this permit would be required.

Each project alternative would disturb more than 0.4 hectare (1 acre) of land area. Accordingly, both are subject to the requirement for an NPDES permit for stormwater discharges from the construction site. Permit coverage for the project will be obtained either under the USEPA general permit for stormwater discharges from construction site activities

(NPDES Permit No. ILR100000), or under an individual NPDES permit. Requirements applicable to such a permit will be followed, including the preparation of a stormwater pollution prevention plan. Such plan will identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site and describe and ensure the implementation of practices that will be used to reduce the pollutants in discharges associated with construction site activity and to assure compliance with terms of the permit.

Archeological and historical surveys were conducted as part of the project compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. Approval from the SHPO is required for project implementation.

As mentioned above, Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Two types of 404 Permits can be issued under the permit review process: an Individual Permit and a Nationwide Permit 14. An Individual Permit is usually required for potentially significant impacts. However, for most discharges that will have only minimal adverse effects, the USACOE often grants an up-front Nationwide Permit 14.

Wetland impacts for expansion of U.S. 67 will require an Individual Permit. Stream crossings that would require a Section 404 permit and the type of permit required (Individual/Nationwide) are listed in Table 4-24.

TABLE 4-24
Stream Crossings Requiring Permits/Certifications

Water Resource	Common Segment	Alternative E	Alternative A
Mauvaise Terre Creek	NW14		
Coon Run		NW14	
Willow Creek		NW14	
Indian Creek		NW14	NW14
Lick Branch			NW14
Tributary to Mud Creek			NW14
Prairie Creek			NW14
Clear Creek			NW14
Illinois River	IND		
Curry Lake (York)	IND		
Coal Creek Ditch	NW14		
Bluff Ditch	NW14		
East Fork Crane Creek	NW14		
Schuy-Rush Lake	IND		
Town Branch	NW14		
Horney Branch	NW14		

TABLE 4-24
Stream Crossings Requiring Permits/Certifications

Water Resource	Common Segment	Alternative E	Alternative A
Ryan Branch	NW14		
West Branch of Sugar Creek	NW14		
Carter Creek	NW14		
Grindstone Creek	NW14		
Camp Creek	NW14		
Troublesome Creek	NW14		

NW14 = Nationwide Permit 14
IND = Individual Permit

4.15 Short-Term Use and Long-Term Productivity Relationship

Short-term uses of the environment would generally be those associated with construction of the highway. Construction of the project would involve the short-term use of resources such as labor and construction materials. The project will also contribute to the maintenance and enhancement of long-term productivity for the communities in the project area by providing improved local and regional accessibility and reduced traffic congestion on existing area roads. Increased travel speeds will save motorists time and lower vehicle operation costs.

Long-term economic benefits resulting from the construction of U.S. 67 include potential for increased tax revenues and employment. Improved access resulting from the construction of the U.S. 67 expressway is expected to stimulate economic growth by expanding market areas and making the area more attractive to new development. By improving access to the area, upgrading U.S. 67 will result in higher regional productivity.

4.16 Irreversible and Irretrievable Commitment of Resources

Impacts resulting from construction that can be neither mitigated nor replaced in the future include the following:

- Roughly 987 hectares (2,438 acres) of land for the Common Segment + Alternative A or 1,067 hectares (2,636 acres) for Common Segment + Alternative E will be committed to U.S. 67 right-of-way. Although the land required for the construction of the project could be converted to another use in the future if it is determined that the proposed roadway was no longer needed, there is no reason to believe conversion would be desirable or necessary.
- Under either alternative, a large amount of agricultural land will be removed from production and numerous farming operations will be adversely affected.
- Large amounts of natural resources such as fossil fuels, aggregate cement, asphalt, sand, and steel will be required to construct the highway. These materials generally are not

retrievable. However, they are not in short supply, and their use in this project will not adversely affect their future availability.

- State and federal funds and manpower used to build U.S. 67 represent an irretrievable monetary commitment. However, the long-term economic and traffic benefits expected to result from the project will outweigh this initial investment.

4.17 Summary of the Impacts of the Build Alternatives

Table 4-25 summarizes the environmental impacts of the alternative segments (Common Segment, Alternative A, and Alternative E) as well as combined impact for the entire alternatives from Jacksonville to Macomb (Common Segment + Alternative A and Common Segment + Alternative E). These impacts will be minimized as much as possible by using appropriate design techniques, construction methods, and mitigation measures as discussed in this document and companion technical reports.

TABLE 4-25
Summary of Environmental Impacts

Resource Impacts	No-Build	Common Segment	Alternative A	Alternative E	Common Segment + Alternative A	Common Segment + Alternative E
Length	0	62.4 km (38.8 mi)	29.4 km (18.3 mi)	36.7 km (22.8 mi)	91.8 km (57.1 mi)	99.1 km (61.6 mi)
Land Requirements						
Total Right-of-Way Required	0	667 ha (1,648 ac)	320 ha (790 ac)	400 ha (988 ac)	987 ha (2,438 ac)	1,067 ha (2,636 ac)
Amount of Existing Right-of-Way Used	0	161 ha (398 ac)	5 ha (12 ac)	126 ha (311 ac)	166 ha (410 ac)	287 ha (709 ac)
Amount of New Right-of-Way Required	0	506 ha (1,250 ac)	315 ha (778 ac)	274 ha (677 ac)	821 ha (2,028 ac)	780 ha (1,927 ac)
Water Body Crossings	0	15	5	3	20	18
Jurisdictional Wetlands						
Number Affected	0	27	9	3	36	30
Area of Direct Impacts	0	12.78ha (31.55 ac)	3.49 ha (8.62 ac)	0.24 ha (0.59 ac)	16.27 ha (40.17 ac)	13.02 ha (32.14 ac)
Cover Type Impacts						
Mesic Forest	0	75 ha (185 ac)	12 ha (29 ac)	26 ha (64 ac)	87 ha (214 ac)	101 ha (249 ac)
Forbland / Non-native grassland	0	9 ha (22 ac)	6 ha (14 ac)	11 ha (28 ac)	15 ha (36 ac)	20 ha (60 ac)
Riverine	0	10 ha (24 ac)	1 ha (2 ac)	2 ha (5 ac)	11 ha (26 ac)	12 ha (29 ac)
Floodplain Forest (wet-mesic)	0	6 ha (15 ac)	2 ha (5 ac)	0 ha (0 ac)	8 ha (20 ac)	6 ha (15 ac)
Sand Prairie	0	0	1 ha (2 ac)	0	1 ha (2 ac)	0

TABLE 4-25
Summary of Environmental Impacts

Resource Impacts	No-Build	Common Segment	Alternative A	Alternative E	Common Segment + Alternative A	Common Segment + Alternative E
Loess Hill Prairie	0	0 ha (1 ac)	1 ha (3 ac)	0	1 ha (4 ac)	0 ha (1 ac)
Notable Plant Communities	0	6	3	1	9	7
Natural Areas Impacted	0	1	1	0	2	1
Threatened and Endangered Species *	0	2	3	2	5	4
Agricultural Impacts						
Total Right-of-Way Required that is Agricultural Land	0	458 ha (1,132 ac)	300 ha (741 ac)	239 ha (590 ac)	758 ha (1,873 ac)	697 ha (1,722 ac)
Prime farmland	0	334 ha (825 ac)	174 ha (430 ac)	141 ha (349 ac)	508 ha (1,255 ac)	475 ha (1,174 ac)
Important farmland	0	78 ha (193 ac)	99 ha (244 ac)	93 ha (230 ac)	177 ha (437 ac)	171 ha (423 ac)
Other (unclassified)	0	46 ha (114 ac)	27 ha (67 ac)	5 ha (11 ac)	73 ha (181 ac)	51 ha (125 ac)
Total Affected Farms	0	110	43	59	153	169
Severed Farms	0	21	27	4	48	25
Otherwise Affected Farms	0	89	16	55	105	144
Affected Centennial Farms	0	0	1	4	1	4
Landlocked Parcels	0	6	0	5	6	11
Adverse Farm Travel	0	0.5 km (0.3 mi)	2.2 km (1.4 mi)	2 km (1.2 mi)	2.7 km (1.7 mi)	2.5 km (1.5 mi)
Estimated Farm Production Losses	0	\$305,100	\$255,200	\$187,500	\$560,300	\$492,600
Displacements						
Residences/Farmsteads	0	13	6	27	19	40
Other Structures (sheds, barns, etc.)	0	32	22	51	54	83
Commercial	0	1	0	0	1	1
Public (Governmental) Facilities	0	1	0	0	1	1

* Illinois Chorus Frog would be impacted along common segments, Alternative A, and Alternative E.

4.18 Unavoidable Adverse Impacts

The project will have the following unavoidable adverse impacts:

- For the Common Segment + Alternative A, 75 structures, including 19 residences or farmstead residences, one commercial establishment, and one governmental facility, would be displaced. For the Common Segment + Alternative E, 125 structures, including 40 residences or farmstead residences, one commercial establishment, and one governmental facility, would be displaced.

- For the Common Segment + Alternative A, 16.27 hectares (40.17 acres) of wetlands would be directly impacted; for the Common Segment + Alternative E, 13.02 hectares (32.14 acres) of wetlands would be directly impacted.
- For the Common Segment + Alternative A, **five** threatened and endangered species would be impacted. For the Common Segment + Alternative E, **four** threatened and endangered species would be impacted.
- Noise levels will increase at residential sites located close to the alignments.
- Direct loss of agricultural land and disruption of numerous farming operations will occur. Indirect agricultural impacts will result from the conversion of agricultural land to nonagricultural uses.

4.19 Mitigation Measures and Commitments

4.19.1 Mitigation Measures

To the extent practicable, wetlands, other natural plant communities, and listed species were avoided. Complete avoidance of these resources was impossible. Unavoidable impacts would be minimized with road design considerations such as:

- Increasing road embankment slopes to minimize the size of the roadway footprint in fill areas.
- Increasing the slope of cut areas with stepped retaining walls to reduce the extent of earthmoving in sensitive areas.
- Incorporating Best Management Practices such as erosion control with properly installed and maintained silt fences and rapid re-vegetation with native plant species.

Mitigation measures are actions taken to compensate for an acknowledged unavoidable impact. The following steps will be taken to compensate for resources or entities that will be adversely affected by the project.

4.19.1.1 Wetlands

In compliance with state and federal regulations, measures have been implemented to avoid and minimize impacts to wetlands. However, there is no practical alternative to the proposed project that does not result in some wetland loss. Project alternatives vary in level of projected wetland impact, from about 16.27 hectares (40.17 acres) for Alternative A (Jacksonville to Macomb) to 13.02 hectares (32.14 acres) for Alternative E (Jacksonville to Macomb).

Compensation of unavoidable wetland impacts through restoration or creation will be undertaken to offset projected losses. The mitigation ratio for each potential wetland impact for the U.S. 67 project is based on the approved IDOT *Wetlands Action Plan*. The project constitutes a Standard Review Action that has to be coordinated with the IDNR and for which project-specific compensation criteria would be met. The IDOT *Procedures Memorandum* provides preliminary compensation ratios based on the level of wetland impact and the location of wetland compensation with respect to impact locations. Preliminary wetland compensation

goals have been developed for the U.S. 67 project following guidelines regarding replacement and sequencing stated in the Illinois Interagency Wetland Policy Act. Generally, the rule establishes replacement requirements that vary depending on whether mitigation occurs onsite, offsite (in-basin), or offsite (out-of-basin). Other factors, such as the presence of state or federally listed species, classification as an Illinois Natural Area, or an FQI score of greater than or equal to 20, also determine compensation goals.

Wetland impacts occur within three drainage basins and involve several wetland types. Some wetland areas also contain state and federally listed species, which may be affected directly or indirectly.

Preliminary wetland compensation goals for the U.S. 67 project are as follows:

- In-kind wetland compensation will be provided on the basis of wetland function and type classification (per Cowardin et al. 1979).
- Individual wetland impacts less than 1.2 hectares (0.5 acre) in size will be mitigated at a ratio of 1.5 to 1 (onsite), 2.0 to 1 offsite (in-basin), and 3.0 to 1 offsite (out-of-basin).
- Individual wetland impacts greater than 1.2 hectares (0.5 acre) in size will be mitigated at a ratio of 2.5 to 1 (onsite), 4.0 to 1 offsite (in-basin), and 5.5 to 1 offsite (out-of-basin).
- Wetlands that contain a state or federally listed species will be compensated in kind at a ratio of 5.5:1.
- Sites that have been designated state natural areas or have an FQI score greater than 20 will be compensated at a ratio of 5.5:1.

Wetland compensation needs expressed in terms of total compensation area and wetland type are summarized for each alternative in Table 4-26 and presented in detail in Appendix J. The projected compensation area is based on the proposed wetland goals, which establish compensation ratios based on wetland type, compensation location, and other factors. A total compensation area of 56.69 hectares (140.07 acres) is estimated for **the preferred alternative (Alternative E)** from Jacksonville to Macomb. **The compensation area for Alternative A would be greater with 64.24 hectares (158.73 acres).**

The above compensation needs are based on total wetland impacts and assume that the mitigation site will be the La Grange Wetland Bank, Brown County, Illinois. All potential wetland impacts south of the Illinois River were considered to be in the offsite (in-basin) compensation category. All impacts north of the Illinois River were considered to be in the offsite (out-of-basin) compensation category.

TABLE 4-26
Wetland Compensation Requirements for U.S. 67

Wetland Unit	Compensation Area *			
	Alternative A		Alternative E	
	Hectare	Acre	Hectare	Acre
Emergent	33.96	83.9	32.30	79.80
PUB	0.23	0.57	0.21	0.52
Forested	22.41	55.38	22.59	55.82
Farmed Wetland	6.05	14.95	0.00	0.00
Other	1.59	3.93	1.59	3.93
Total	64.24	158.73	56.69	140.07

* Compensation area based on total wetland impacts

The IDOT is proposing to mitigate the project's wetland impacts at the LaGrange Wetland Bank. The site is located in the northeast corner of Brown County, Illinois, and is currently under development. The property is approximately 666 hectares (1,645 acres) in size and **IDOT holds fee-simple interest to all acreage within the site.** The cover types and NRCS wetland determinations for the proposed LaGrange Wetland Bank site are depicted on Figures 4-3 and 4-4, respectively. The Meredosia Wildlife Refuge is approximately 8 kilometers (5 miles) south of the site on the eastern bank of the Illinois River.

The La Grange Wetland Bank site is located approximately 4.8 kilometers (3 miles) southwest of Beardstown. The LaMoine River forms the sites northern boundary and the Illinois River forms its eastern boundary. The site is located at the southeastern tip of the LaMoine River drainage basin is situated at the intersection of two other drainage basins and **near a fourth basin.** These basins, the LaMoine, Central Illinois, Lower Illinois, and Sangamon River, comprise approximately 25 percent of the land area in Illinois. Due to this unique location, the site could serve a much larger in-basin area than just the LaMoine River basin.

Much of this site was converted from wetland to agricultural use prior to the Food Securities Act of 1985 and is creditable if restored to wetland function. The site is surrounded by a levee that barely exceeds the elevation of the 10-year flood. The site floods annually from a variety of water sources, including drainage out of the bluffs, seepage through or breaching of the levee, overtopping of the levee, and groundwater discharge. Small drainage channels have been constructed throughout the midsection of the site and drain to a larger ditch along the southern boundary. The water is passively drained or pumped as desired by the tenant farmer.

The La Grange Wetland Bank **has a number of natural attributes that make it** an excellent candidate site for conducting a large-scale wetland restoration for the purpose of providing wetland mitigation for IDOT projects. The site contains the federally threatened decurrent false aster (*Boltonia decurrens*) and receives heavy usage from a number of shore birds, wading birds, and waterfowl.

The site development plan for the La Grange Wetland Bank is shown in Figure 4-5. Under the plan, existing wetlands would be preserved and enhanced. Farmed wetlands would be enhanced and maintained as emergent wetlands. Prior converted land would be restored to either emergent, scrub-shrub or forested wetlands. The arrangement of wetland types is based on soils information, pre-settlement vegetation, and certified wetland determinations.

The site plan includes restoring wetland hydrology with a connection to the Illinois River. The connection would be opened and closed to emulate the original hydrograph of the Illinois River. The existing levee system would be retained and a number of spillways would be placed in the levee to convey peak discharges and prevent levee failure.

4.19.1.2 Threatened and Endangered Species

To the extent practical, areas supporting threatened and endangered species were avoided. Complete avoidance of listed species was not possible. Unavoidable impacts would be minimized with road design considerations such as:

- Increasing road embankment slopes to minimize the size of the roadway footprint in fill areas.
- Increasing the slope of cut areas with stepped retaining walls to reduce the extent of earthmoving in sensitive areas.
- Incorporating best management practices, such as erosion control with properly installed and maintained silt fences and rapid revegetation with native plant species.

Mitigation measures are actions taken to compensate for an acknowledged unavoidable impact. The following steps will be taken to compensate for listed species that will be affected adversely by the project. At this time, it has been determined that Alternative E is the preferred alignment. The discussion below references mitigation measures for both Alternative A and E.

Decurrent False Aster. It has been determined that the population of decurrent false aster will not be affected directly by the proposed project. However, decurrent false aster does have a tendency to appear at different locations on an annual basis and could appear at a shifted location at a later date. Before construction begins in this section, the project area will be surveyed for the species. If the species is found within the right-of-way, seeds and root stocks, will be collected and transplanted to the LaGrange Wetland Bank. Coordination with the IDNR and U.S. Fish and Wildlife Service will occur if this action is undertaken. A few individual decurrent false asters occur on the LaGrange Wetland Bank site.

Hall's Bulrush. Hall's bulrush, a state threatened plant species, would be affected by Alternative A. The species is an annual and is adapted to wet depressions in agricultural fields (farmed wetlands) and sand ponds. It can occur intermittently at sites. As an annual, the plant cannot be transplanted. It can exist only on sand substrates, so that seeding at the LaGrange Wetland Bank would not be an option. Mitigation for this species would include additional surveys to determine location and extent of the population, collecting species located in the proposed right-of-way, planting in appropriate habitat within the right-of-way, and follow-on coordination with IDNR.

Patterson Bindweed. Patterson's bindweed, a state endangered plant species, would be impacted by Alternative E. The species is a perennial from a deep taproot. One individual plant has been identified within the project area. Mitigation for this species would include transplanting the affected population to suitable habitat on the existing right-of-way. The transplant site will be identified and monitored, and the results coordinated with the IDNR.

Regal Fritillary. Regal fritillary, a state threatened invertebrate species, would be affected by Alternative A. Twenty to twenty-five individual species were observed nectaring at Site 17. Mitigation would include more intensive surveys, which would define more accurately the habitat and distribution of the species within the project area. Habitat based on nectaring and breeding (oviposition, caterpillars) needs must be clarified before impacts can be assessed and potential mitigation options can be fully developed.

Illinois Chorus Frog. The Illinois chorus frog would be affected by the A, E, and Common alternatives. The sites are assumed to be breeding sites. The frogs spend more time in nonbreeding habitats than in breeding habitats; any discussion of impacts is biased toward breeding habitat. The relationships between the frogs movements and distance between their nonbreeding and breeding habitats is unknown.

The distribution of the chorus frogs on the Illinois River floodplain south of Beardstown is mainly based on Beltz (1993) and limited surveys conducted for this project between 1995 to 2001. The actual dynamics of frog movement across the floodplain are unknown.

Because the above-mentioned features are not known it would be premature to designate a chorus frog mitigation site. A plan for mitigation will require more detailed study of chorus frogs in the project area including: the characterization of chorus frog nonbreeding habitat; determination of the relationship between breeding and nonbreeding habitats; determination of chorus frog migration over floodplain areas; and establishing the relationship of chorus frogs occurring on the bluffs east of Beardstown to those occurring on the floodplain. The output from these studies will be used to define measures that would lessen the impact of the proposed project on frogs. Additionally, this information will be useful in defining roadway design features that will be more compatible with the presence of frogs.

At this time, the IDOT will initiate studies with the appropriate personnel to determine the above-mentioned criteria. These surveys will start in February 2003.

4.19.2 Commitments

4.19.2.1 Traffic

A traffic management plan would be developed and implemented during the construction phase of the project to provide reliable access to agricultural fields, residences, businesses, community facilities and services, and local roads. Local roads that would be intersected by either alternative would remain open to traffic with minor interruptions during construction. IDOT would coordinate construction activities, sequencing, and traffic management plans with fire, police, and emergency rescue services to minimize delays and response times during the construction period.

4.19.2.2 Property Acquisition

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides for payment of just compensation of private property acquired for a federal-aid project. Offers of just compensation for residential and business properties will be based upon approved estimates of fair market value supported and documented by professional real estate appraisals obtained by the acquiring agency, the IDOT. In addition to the just compensation for the acquired property, the Act also provides for certain relocation assistance and payment to displaced homeowners, residential tenants, and businesses that are required to relocate because of the project. IDOT will offer and provide relocation assistance to each displaced family and business. Each displaced family and business will be contacted by IDOT in order to address specific needs and problems that any displaced family or business may have. Displaced families will be eligible for moving costs and may also be eligible for replacement housing payments. Displaced businesses will be eligible for searching and moving costs to relocate to a replacement business site. IDOT's acquisition and relocation agents will be available to present and explain both the acquisition program and the relocation program to each displaced family and business.

4.19.2.3 Borrow and Disposal

The amount of floodplain crossed by Alternatives A or E will require sizeable amounts of borrow. Borrow sites are contractor-furnished prior to construction, and the use of dredge material from USACOE dredge disposal sites and dredge operations is being considered as an option where feasible. The contractor would dispose of unusable excavated material in accordance with state and local regulations and other special provisions to ensure protection of wetlands and waterways. All waste and demolition material from the project will also be disposed of in accordance with applicable regulations. All sites are screened for environmental resources via the Environmental Survey Request process.

4.19.2.4 Water Quality and Hydrology

According to the IDOT *Joint Design/Construction Procedure Memorandum on Erosion and Sediment Control*, proper erosion control methods would be employed to minimize erosion and sedimentation. Erosion control devices would be installed before the onset of construction work that could cause erosion. Temporary or permanent erosion control methods would include silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, rip-rap on exposed banks, erosion mats, and mulching. Disturbance of streamside vegetation would be kept to a minimum. Disturbed areas would be seeded or stabilized upon completion of construction. Construction activities near special or sensitive streams and creeks could be conducted during low or normal flow periods if necessary.

Structure sizing would be performed in accordance with state and federal guidelines regarding floodplain encroachment and hydraulic capacity. All new structures would comply with these guidelines.

Drainage systems, including ditches and farmland drain tiles, would be maintained, restored, or re-established in a manner that would not impound water. Retention facilities may be considered in locations adjacent to streams, creeks, and wetlands to intercept highway runoff before entering the waterway. Construction staging areas would be selected

in accordance with special provisions to ensure that the staging areas would not adversely affect water resources.

Accidental spills of hazardous materials and wastes during construction or operation of the facility would require special response measures. These occurrences would be handled in accordance with local government response procedures. The first response is typically through the local fire departments and emergency service personnel to ensure public safety and to contain the substance to prevent harm to the environment. Depending on the nature of the spill, the IEPA would be notified to provide additional instructions regarding cleanup.

Demolition of the Illinois River Bridge would require a combination of measures to protect water quality:

- Protective shielding could be installed during deck removal to prevent debris from falling into the river.
- Truss spans could be cut and removed in sections by barges.
- Bridge girders could be cut and removed in sections.
- Piers and substructures would be removed to at least 0.3 meter (1 foot) below the ground line. Cofferdams, like those used for pier construction, could be used to access the existing piers and to minimize disturbance to the river bottom.

During construction of the new Illinois River Bridge, care would be taken to minimize environmental impacts. As required in Section 107.01 of IDOT's *Standard Specifications for Road and Bridge Construction*, contractors constructing the Illinois River crossing would at all times observe and comply with all federal and state laws, local ordinances, and regulations that in any manner affect the conduct of the work.

4.19.2.5 Agriculture

Each farm property adjacent to both Alternatives A or E would be provided field access to and from U.S. 67. Median openings would be provided at all public road intersections as well as other locations to allow median crossovers.